

# FLIGHT

&  
The AIRCRAFT  
ENGINEER.

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport  
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## Flight

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## NOTICE OF REMOVAL.

The Offices—Editorial and Advertisement of "FLIGHT and The Aircraft Engineer"—on November 10th have been removed to more convenient premises at

36, GREAT QUEEN STREET, KINGSWAY, W.C. 2.

The telephone number remains Gerrard 1828, and the telegraphic address is Truditur, Westcent, London.

All communications should therefore now be addressed to

36, Great Queen Street,  
Kingsway,  
London, W.C. 2.

"Newspapers are an essential part of our war organisation."—  
(Sir Auckland Geddes, Minister of National Service.)

## EDITORIAL COMMENT.

HE promised Bill for the creation of a single Air Service was introduced into Parliament on Friday of last week. The Bill, the full text of which will be found in another part of this issue of FLIGHT, is a landmark, not only in the history of aviation, but in that of the armed forces of the Crown. No longer is the aerial arm to be a mere subsidiary weapon in the hands of our commanders by sea and land, but

it is by a single stroke raised to "One Air Service; One Uniform; One Badge." been occupied by the Navy and the Army alone.

It is necessary at this juncture to say that this does not at all mean that our commanders are to be deprived of the necessary aircraft for the prosecution of their

operations, nor that the aerial arm, or that portion of it which is attached to the fleets and armies operating at sea or in the field, is to be taken from under their direct command. On the contrary, and as we have pointed out times almost without number, the object of the Bill is entirely and solely to co-ordinate effort and strengthen our fleets and armies in the matter of essential aerial equipment.

More important even than this, it is designed, and we doubt not will achieve its object, to once and for all put a stop to the ruinous competition and jealousy between the two existing Air Services. That competition and jealousy, as we have reason to know, have had a far worse effect in retarding progress and development than most people are aware of, and even the widened powers of the present Air Board have not availed to put a complete stop to it. As we have always maintained, there was only one real remedy, one panacea for the ills under which our Air Services suffered, and that remedy is applied by the Bill which we trust and believe will reach the Statute Book with the absolute minimum of delay.

The rock on which most of the opponents of the single air service have split is the idea that aircraft and air war have any root connection with war on land or sea—that aerial operations are of necessity merely complementary in their character. That idea is the erroneous one which regards the aeroplane and the airship merely as, for one set of purposes, a sort of super-cavalry for reconnaissance, and for another as a long-range gun for the bombardment of objectives beyond the reach of artillery. It does not grasp the fundamental fact that while these are indeed a part of their function, and an admittedly very important part, aerial operations in war go much deeper. Let us take a case in point to illustrate the meaning of this



dictum. During the recent operations in Palestine a great deal of exceedingly valuable assistance was given to the British land forces by ships of the Royal and the French Navies. Now, undoubtedly it is an important function of ships to assist troops operating ashore whenever opportunity offers, but we take it no one would have the temerity to argue that it is their sole or even their principal function. Again, we create powerful fortified harbours for the protection of our arsenals and dockyards, but it cannot be said that the only function of guns and fortifications is to protect such establishments. It is just as logical to argue that the limitations of the aerial arm are contained within the four corners of the proposition that aircraft are simply complementary to armies and fleets as are cavalry and guns. On the contrary, aerial war is and must be entirely distinctive in character in its wider aspects. The difference of outlook is born of the fact that, whereas ships and guns and fixed fortifications have existed for centuries and we have been able to watch their functions develop slowly and thus to appreciate those functions, the aerial arm has come to maturity in a day, as it were, and the world has not had time to digest its full possibilities. Its development has been too rapid for close study, and only those who have made it their single concern have even an approximate idea of its full potentialities and actual power.

• • •  
**The Points  
of the  
Bill.**

The Bill now before the House of Commons recognises that the air is no less distinctive a fighting element than the sea or the land, and raises the Air Force to the same status as that of the Navy and Army. It provides for the Constitution of an Air Council, to be presided over by a sixth Principal Secretary of State—there are at present five Principal Secretaries, these being for Foreign Affairs, Home, the Colonies, India, and War, only four of whom can sit in the House of Commons. The Secretary of State for Air Affairs, as we presume he will be called, is to be added to the number of those enabled to sit in the Commons. When the Bill becomes law and the Air Council is established by the necessary Orders in Council it will have the same standing and status as the Admiralty and the Army Council, and its powers over the Air Force, which is to be constituted under the powers conferred by the Bill, will be exactly on a footing with those exercised by those two bodies over the Navy and the Army. This brings us, clearly, to the consummation of the ideal for which FLIGHT alone has fought for so long—"One Air Service; One Uniform; One Badge." We hasten to admit that we have not been by any means alone in the advocacy of the idea of a single Air Service, but we do claim that where others have kept to the general we have been completely specific and have gone all out for a Service equal in standing, administration and control to the existing fighting services and separate altogether and entirely from them. There is nothing to be gained now from traversing old ground, so we will not indulge in any recapitulation of our arguments for the complete separation of the Air Service. The cogency of those arguments is amply proved by the action of the Government in accepting the views expressed so often in these columns, and that is enough in the meantime.

To return to a consideration of the text of the Bill. No date is fixed for the establishment of the Air Council named in the Bill. This is left, among other details, to be fixed under the terms of the Order in

Council, which the Bill enables His Majesty the King to make, constituting the "Air Force." It is as well to keep the point clear that the Bill is simply an "enabling" one, which would lead to the obvious conclusion that the desire is to make the requisite changes gradually and with a view to the prevention of any disorganisation of the continuity of aerial effort under present existing conditions. At first sight, the Bill being, as we have said, simply an enabling one, it would appear to open the door to all sorts of delays in the creation of the new Air Force. Clause 1 provides that: "It shall be lawful for His Majesty to raise and maintain a force, to be called the Air Force, consisting of such number of officers, warrant officers, non-commissioned officers and men as may from time to time be provided by Parliament." There is, it will be observed, nothing in the wording of the clause which sets a period within which this Air Force is to be raised, and, certainly, it would be possible for the matter to be hung up indefinitely if the Government were not in earnest about it, or if the Bill had been drafted simply as a sop to that very powerful section of informed opinion which has been urging the raising of such a Force. But there is, we are confident, no reason to fear, once the Bill has been passed into law—as it undoubtedly will be—that there will be any delay at all in proceeding to make its provisions effective. On the contrary, we believe that no time will be lost in putting it into operation.

• • •  
**The Effect  
on the  
Existing  
Air Services.**

The natural effect of the provisions of the Bill is that the R.N.A.S. and the R.F.C. will disappear, but the rights and privileges of those serving in either are fully safeguarded under the terms of the Bill. Officers or men of these services may be—which we take to mean *will* be—transferred *without their consent* to the new Air Force. If, however, notice be given by the officer or man concerned, within three months, that he does not wish to be transferred, the transfer will be annulled. Obviously, this is by far the best way of dealing with the situation that will be set up. The only alternative seems to be to take a sort of referendum of the two Services, which, manifestly, would not only be difficult but completely subversive of all discipline, since it would undoubtedly lead to meetings and discussions—and we certainly do not want a small edition of the Soviet. Not that we imagine there will be any wide-spread objection to the new order of things, but there is always a noisy malcontent minority, even in the Services, to which it is just as well to give no opportunity of raising trouble.

Transfers from units other than the R.N.A.S. and R.F.C. to the Air Force will be for four years, or for the duration of the war, as the case may be, and officers or men of the Naval or Military forces may, with the approval of the Admiralty or Army Council, be transferred for that term. In the case, however, of men who have been called up under the Military Service Acts, or who after voluntary enlistment have been transferred to the reserve, they will be liable, on being called up, to be transferred to the Air Force.

In the matter of the discipline of the Air Force, the Army Act is to be taken as the basis, and will, with certain detail amendments necessary to adapt it to the purpose, be printed as a separate Act and entitled "An Act to provide for the Discipline and Regulation of the Air Force," and is to be cited as the "Air Force



FLIGHT

OUR FLYING SERVICES AND THEIR WORK.—Flying in a fog at the front. Recently, an R.F.C. Captain was decorated for co-operating under extremely unfavourable weather conditions of this character with our artillery. On one occasion in particular, although very much hampered by mist and clouds, he ranged three of our batteries on to a hostile battery position and enabled them to demolish it, his splendid example having been of the greatest value to his squadron.

Act." This Act is to continue in force only so long as the Army Act continues in force, which means that it will be an annual enactment, subject to continuation under the Expiring Laws Continuance Act. Finally, the Bill provides that the resultant Act shall be known as the Air Force (Constitution) Act, 1917.

It is manifestly impossible to pass a final judgment on the new order of things, for the reason that this is only, for the time being, in embryo form. The Bill still has to pass the scrutiny of both Houses of Parliament, and it is impossible to say what form it will have taken by the time it has passed its third reading and is ready for the Royal assent. But it is possible to say this much, that if it reaches the Statute Book exactly as it has been framed we believe it will have achieved all the main objects which those who have been fighting for the constitution of a separate Air Service have laid down as essential to the aerial defence of the Empire. That being so, we can only now wish the Bill a safe and speedy passage on its way to becoming the law of the land.

Our article under this heading, in the issue of "FLIGHT" of October 11th, in "The First Class Air Fighter," which we dealt with some of the difficulties placed in the way of good men who desire to become Air Service pilots, has brought us quite a crop of correspondence. Most of the letters to hand bear out, with chapter and verse, all we said on the subject. Taking one case as typical, a correspondent tells us that as far back as January of 1915 he tried to join the flying service in British Columbia, but was rejected as being under the standard of height. In October of the same year he went to an aviation school, with the object of qualifying for a brevet, but owing to shortage of school machines and a large class it was not until the following June that he really received tuition in actual flying. All the time, however, he was gaining valuable workshop experience. Just as he was getting along well, the only available machine was crashed by another pupil, and before it could be rebuilt the school was broken up; all the pupils were accepted as cadets for the R.F.C., half of them being sent to England and the rest, except our correspondent and another, went to the Toronto school. The two who were left out were rejected because they were slightly overage, although they had been accepted by the representative of the R.F.C. and told to await transportation! After waiting for more than three months he was informed that his acceptance could not be confirmed, as he was over age! In the meantime, he had attached himself to a Canadian Regiment, and, being a pertinacious sort of youth and determined to fly, he obtained his discharge and enlisted in an Imperial unit, under the impression that it would be easy to transfer when once he had landed in England. Within a week of arriving in England he had been recommended by his C.O. for transfer and passed the medical examination, but before the transfer had time to be accomplished he was moved to another camp. Several weeks went by and then transfer papers were again put before him for his signature. These were duly completed, and, presumably, forwarded. Another three months went by, and he was then told that his transfer would not go through and he has not been able to discover any reason for it.

We have given the exact facts as outlined to us. We admit that it is an *ex parte* statement and there may conceivably be more behind the matter than has been

disclosed to us. However, we have no reason to doubt the good faith of our correspondent, the more so as we know the case as set forth to be typical of many others. Now, the authorities tell us that pilots and yet more pilots are needed. Two or three weeks ago we printed what amounted to an urgent appeal from the authorities for young men to join the flying services, and yet we constantly find that insuperable difficulties are often encountered by men who desire to answer the call to serve the country in the service for which they feel themselves most fitted. There is evidently a screw loose somewhere, and it should be tightened up immediately. As we pointed out in the article to which we have referred, it should be made a definite regulation that *every* application for transfer to the Air Service, except where the application is made for vexatious purposes or where the applicant is obviously unfit for command, should be forwarded to be dealt with by the proper authority. Where either of these reasons is advanced the officer concerned should be called upon for a clear statement of why he declines to endorse the application, and the man himself should be informed.

Mr. W. Ewart Chester, the managing director of the Davidson Aviation Co., is the writer of two very thoughtfully expressed articles on this subject, published recently in the *Westminster Gazette*. They are too long for us to deal with extensively, but it may be said that in them Mr. Chester presents the case for and against the adoption of aeronautical engineering as a profession with considerable force and lucidity. He finally arrives at the conclusion—with which we entirely agree—that, given the proper degree of adaptability and capacity, aeronautical engineering offers a magnificent career to the young man who has arrived at the parting of the ways. He points out that it is not sufficient for the youth to be enamoured merely of the idea of becoming a pilot, because before long almost every one will have learnt to control an aeroplane and pilots will be as plentiful as taxi-cab drivers and little better paid. But if the prospective entrant into the profession has a real aptitude for mechanics, a love of mathematics, and at least a liking for chemistry, then it offers him a really attractive career.

There is no fear, the writer points out, that the development and multiplication of aircraft will come to a dead stop at the end of the war, even if Armageddon has as its sequel international disarmament. Nothing could be further from the truth. The commercial possibilities of aviation are altogether independent of its importance as a military factor. It is true that under the stimulus of war the development of aircraft in speed, size, and engine-power has been enormously accelerated, but in any case it was sure to have come. The difference is that for the supreme purposes of war progress has been made in three years which for the mere purposes of peace might have taken a decade or even more to have consummated. As a result of this progress aviation for commercial purposes will be a practical proposition as soon as peace is restored. With the coming of peace we shall witness the beginning of a new era of travel, with the regular conveyance by the air, day by day, and all over the world, of mails, passengers and the lighter kinds of merchandise. Having got so far as a result of the world-war, the scientific men who have

been working out the problems of aviation during the years of struggle will not desert when the great conflict is over. With commercial aviation as a going concern they will have every inducement to continue their research, but with a different goal in view—not the greater efficiency of aircraft as fighting machines, but their greater safety, reliability, and comfort as a means of transit.

There need be no fear, therefore, that the youth who decides now to adopt aeronautical engineering as a profession is entering upon a "dead end." On the contrary, the prospects are more than flattering, and had we sons to place we should certainly, after duly arriving at the decision that they possessed the essential qualifications, choose such a career for them.

**Officers' Records of Service.** The Army Council has issued an Instruction which states that the constant changes in the posting of officers, inevitable under present conditions, have

shown the want of some readily accessible record of services and qualifications which officers can produce on being posted to a new unit or on the arrival of a new commanding officer. It has consequently been decided that every combatant officer whose permanent rank is below that of lieutenant-colonel shall be provided with a book in which his services will be recorded in accordance with instructions contained therein.

This book will be carried by the officer, and will be produced whenever required by a superior officer under whom he may be serving. Commanding officers should always ask for the books of any officers who join their units, and should take into consideration their qualifications and previous services in comparison with those of any officers who may be commanding companies, &c., temporarily, and when such positions become vacant.

This is an excellent departure, and will, we imagine, be welcomed by most officers serving in combatant units. The Instruction explains itself, so there is no need for comment, further than that, as we have said, it is excellent and will remove a lot of the vexation caused by officers posted to new units having to enter into long and detailed explanations of who they are and from whence they have come. The wonder is that the need for some such system has not made itself apparent long ago.

**Aerial Postal Services after the War.** The Postmaster-General has definitely announced that after the war it is intended to inaugurate and carry on aerial postal services between London and the various European capitals.

Apparently, he does not take much stock of the possibility of an economic outlawry of Germany, since he made no exceptions in his pronouncement. That, however, is by the way, and we can leave that part to take care of itself. What does concern us is that we are brought face to face with the realisation of what we have for years believed and maintained as a fundamental article of aerial faith—that so far from the aeroplane being the toy of the sportsman and the weapon of the fighting man, it is an eminently and entirely practical vehicle of locomotion. Even to-day, though, there are many who regard the idea of a world linked up by lines of aerial travel as the dream of visionaries—they are so lacking in the essential quality of imagination that they are unable to see the thing that is not actually there to be seen in its concrete

and accomplished form. To such the bald, convincing statement of no less an authority than the Postmaster-General must carry a great deal of conviction, and the "visionaries" are right and they have been wrong. Be it observed that Mr. Illingworth did not qualify his announcement. He did not say that if experiment demonstrates it to be practical, or if the proper type of aeroplane can be evolved we *may* have aerial postal services. Not at all. We *are* to have them, because—and this is the point that matters—the postal authorities, having watched the aeroplane through all its stages of development, *know* that they are absolutely safe in taking all their account with the new factor in locomotion. There is really no need to elaborate the point, which is one we have often striven to be convincing upon, further than to say that we can regard the statement of the Postmaster-General as a real landmark in the history of aerial travel second in importance only to the realisation of his announcement.

\* \* \*

**A National Aeroplane Factory.**

The reported intention of the Ministry of Munitions to establish a great national aeroplane factory has, as might have been expected, given rise to a great deal of discussion in interested circles. On the one hand, Mr. Churchill and his advisers are said to have arrived at the conclusion that the best and most economical way by which the imperative demands of the Air Service can be met would be to follow the same course of procedure as has been adopted to supply the Royal Navy with ships. The argument is that if we have national shipyards, why not a national aeroplane factory?

The problem is admittedly a gravely difficult one whereon to pass a considered judgment at a time like the present. Granted that the main principle, which should be the governing factor, is that private interests should not be allowed to conflict with national needs, it might seem on the face of it that the case had been established for the Government factory. But we cannot in such far-reaching concerns as this take anything at its face value. We must look deeper and beyond the merely apparent.

It is quite clear that supposing the scheme of a national factory to be adopted it cannot be made entirely effective for the purposes of *this* war, and therefore we must continue to rely in bulk on the private constructor to see us through. Now, to take no higher ground, is it in accord with the principles of common justice that we should kick down the ladder by which we have climbed to success as soon as we have arrived at the top? There can be only one answer to this—no! That, however, is an argument which we do not expect to carry much weight with a Government department. But the question is capable of being argued on grounds of public policy. Is it likely that aircraft construction would progress to the same degree under Government administration as it would were a wise policy of encouragement of the private constructor adopted as a main plank in the platform of Air Force expansion? In the light of experience we say emphatically that it would not.

The analogy has been drawn between the supply of ships for the Navy and of aeroplanes for the Air Force. We are content to take it at that, because we maintain that the complete control over design exercised by the Construction Branch of the Admiralty has not invariably been an unmixed blessing to the Fleet. Its

policy has been to work out its own designs and to practically ignore the work of private constructors, such as Vickers and Elswick. One of the consequences of that policy was to give us "soft" ships like, for example, the *Niobe* class of cruisers, hopelessly under-gunned, under-armoured, and inferior in speed to the ships that were being built by private yards in this country for foreign Governments. The old *Royal Sovereigns* were another case in point. The class gave us a number of ships, classed as first-class battleships, which could have been put out of action in half-an-hour by ships like the contemporary Japanese *Asama*,

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built by Elswick and classed as an armoured cruiser. We agree that of late years policy has been better and has given us relatively better ships—ships comparable to any in the navies of other Powers, but the lesson is nevertheless there to be used and we do submit that it has a very strong bearing on the question under discussion. We shall certainly want to hear some more convincing arguments than have been advanced hitherto, before we can subscribe to the belief that anything will be gained by putting all our aerial eggs in a National Factory basket. We shall return to the subject in season.

#### Medals for the R.F.C.

It was announced in the *London Gazette* on November 2nd that the King had been pleased to award the Military Medal for bravery in the Field to the following:—

7546 1st Air-Mech. P. E. GUDGEON, R.F.C.  
8361 1st Air-Mech. W. G. HODGES, R.F.C.  
33549 1st Air-Mech. J. A. NEWELL, R.F.C.

The King has been pleased to award the Meritorious Service Medal to the following for gallantry in the performance of military duty:—

1078 1st Air-Mech. A. J. MERRITT, Aus. F.C.

#### "Mentioned in Despatches."

In a list published on November 7th of officers whose names have been brought to the notice of the Secretary of State for War for valuable services rendered in connection with military operations in the field, the following appeared:—

Bt. Lieut.-Col. (Temp. Brig.-General) W. G. H. SALMOND, D.S.O.

#### A Gift from Canada.

SUPPLEMENTING his gift of three aeroplanes to the Canadian authorities, Mr. James Carruthers, of Montreal, ex-President of the Montreal Board of Trade, and President of the Canada steamship lines, has offered to the British Government, through Lieut.-Colonel W. Grant Morden, four battleplanes for use on the Western front, and the Air Board has expressed "its warm appreciation of so generous a contribution."

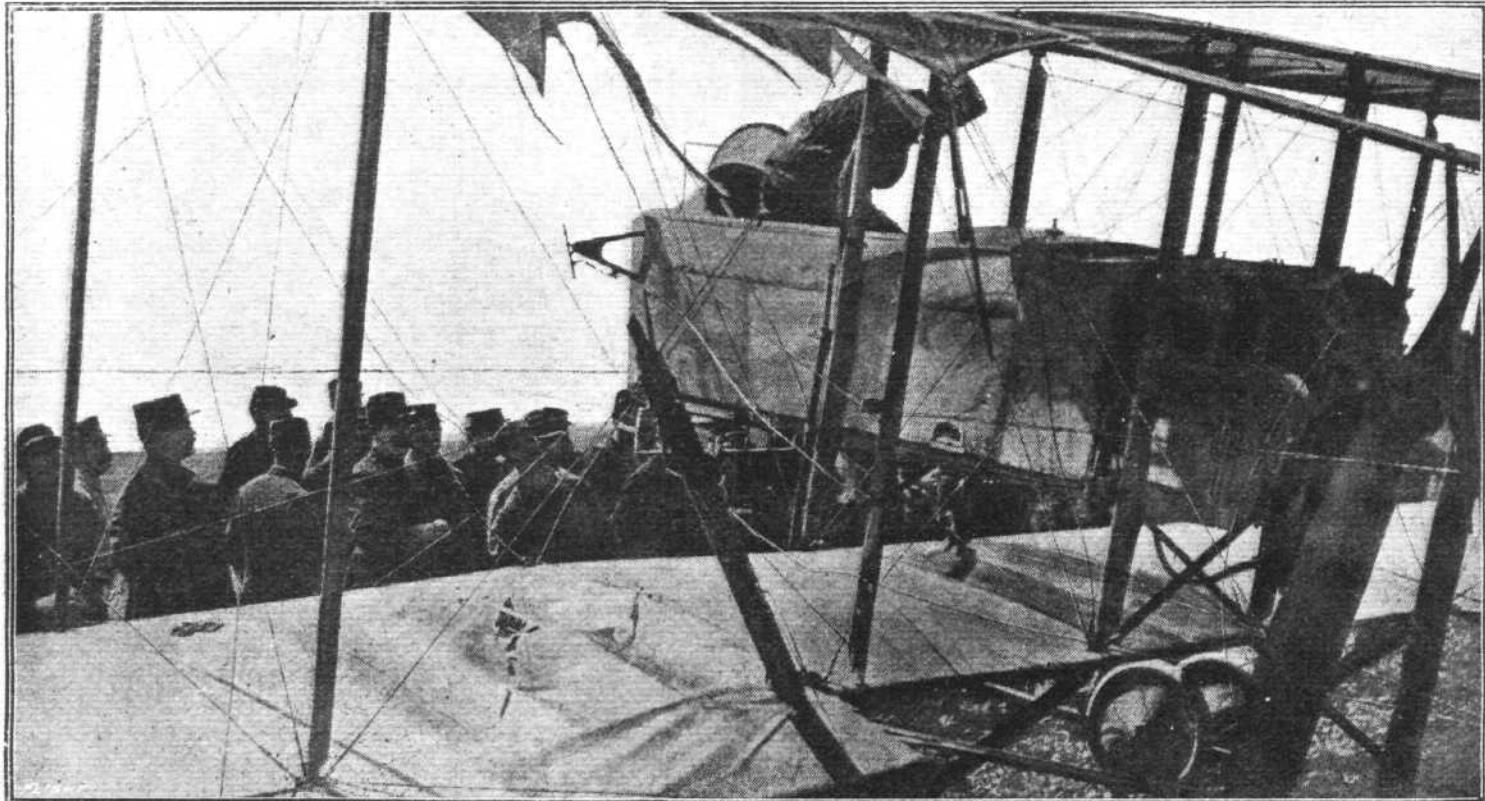
#### The Government's Compensation Scheme.

PRESIDING over a meeting of the committees of the Committee on War Damage held at the Mansion House on November 8th, called to consider the Government scheme for giving compensation for war damage without insurance, the Lord Mayor said that half a loaf was better than no bread, but the scheme fell so far short of what they had a right to expect from the promise of the Prime Minister that they could not be content with it.

Mr. Mark H. Judge, chairman of the committee, proposed a resolution expressing disappointment at this insufficient outcome from the Prime Minister's reply to the committee on July 13th, especially as all sufferers before September and all sufferers in person had been left out of account, and calling for its immediate reconsideration by the Government. He said air raids had brought the whole civil population into the firing line, and made war more frightful than ever. They must not forget the claims of those who might fall, or suffer in body or estate, whether they were in the Army, in the Navy or in civil life.

The Lord Mayor of Hull seconded the resolution. It was to be hoped, he said, that the committee would continue their work until some further concession had been obtained from the Government. The present scheme was altogether inadequate, especially in limiting national responsibility as from September.

The resolution was passed unanimously.



**A REMARKABLE ESCAPE.**—In these days of high-power high-speed machines it may be well to look back lest one forgets that earlier in the war much excellent work was done on machines which did not begin to compare with the modern aeroplane as regards efficiency and performance. The above photograph, which is reproduced by courtesy of *La Guerre Aérienne*, shows the appearance of a biplane on which, in 1915, Captain Morris, since taken prisoner by the Germans, and Corporal de Ram had been for a reconnaissance flight. The machine was heavily shelled, several struts and other wing parts being broken. Corporal de Ram, in spite of the unsecure foothold offered, climbed out on the lower wing, while at a height of 2,000 metres, and made fast, as well as possible under the conditions, some of the broken parts, which feat enabled the machine to reach home in safety.

## NOTES ON THE RUNNING OF AIRCRAFT ENGINES, FOR THE USE OF PILOTS.

By "GNOMAD."

(Concluded from page 1169.)

### Magneton.

Now that the Bosch magneto, or, in fact, any other kind of "Boche" mechanism, is unobtainable, it is sad to have to say that trouble is occasionally to be met with in present-day magnetos.

Should anything go wrong with a magneto, it will rarely be the pilot's duty to put it right, and no one, who is not fully qualified, should "monkey" with this part of the engine. The following notes are given more in the way of precautions, which may reduce the liability to breakdown.

Amongst the points to be looked to with care are the following:—

The method of attachment, of the magneto, to the engine. The screws, nuts, studs, or bolts which are employed for this purpose should be constantly examined for signs of slackness; especially is this the case with rotary and radial engines, where the vibration is likely to encourage any tendency in this direction.

The above advice, and, in fact, all precautions recommended under the heading of "Magneto," should be scrupulously followed in the cases of nine cylindered rotaries, in which cases the magneto is driven at a speed which approaches the limits of its capacity. In these (nine-cylinder) engines it is especially important that the magneto should function under the most congenial circumstances.

Carbon brushes occasionally give trouble, which may be mitigated by attention to the following notes:—

A very slight application of first quality vaseline, to the brush, will act as a lubricant, reducing wear, and reducing the likelihood of chipping or cracking.

The pencil (long insulated bar conductor, from H.T. brush to distributor) occasionally collects enough dirt and oil, at the distributor end, to impair its conductivity. This is best remedied by a touch with a small twist drill, care, of course, being taken to merely brighten the metal, and not to remove it.

It need hardly be remarked that scrupulous cleanliness is all important, especially about the contact breaker, the rocker arm being mounted in a small fibre brush which is very open to derangement, with serious consequences. No oil should be allowed to get into this fibre bush, which is apt to swell and hold up the contact breaker, especially in cases where water or damp have got near it.

If suspicion is aroused it is always best to remove the spring from the rocker, and test the freedom of the rocking motion, as the pressure of the spring is likely to disguise a slight stiffness. A slight stiffness may not prevent correct functioning at slow speeds, but is very likely to do so at high speeds. *En passant*, it will be well continually to bear in mind that faults may not appear until the engine is running at full speed, and a fault which only appears at high speed is very often more easily diagnosed by that virtue.

It is not proposed to deal at all thoroughly with the magneto, as that would be outside the scope of this article, which is intended solely for those who are not supposed to be engineers, but who may care to have a few elementary "tips" about the mechanism, in which, at any rate occasionally, their interest may be intense. However, to

revert to carbon brushes, especially to that brush which collects the H.T. current that is led to the distributor. This brush is held in its socket by means of a very delicate spring, and serves to retain the spring in position and to supply the pressure needed to make a satisfactory contact. The spring itself is generally of spiral formation, the smaller end being "sprung" on to the carbon brush, which has a small groove or notch cut for this purpose; the larger end of the spiral goes into the brush holder. When replacing this spring great care should be taken not to use force, as this is sure to destroy the nature of the spring, which should be revolved, clockwise fashion, and only slight pressure exerted. The spring will gradually "screw" itself into the correct position.

### General Care of Engine.

In dealing with the above heading the writer is beset with the great difficulty of how much to write and how much to leave out. The reader is again asked to remember that these notes are not intended for those whose duty it is to keep engines in order, and anything tending to introduce highly technical subjects is studiously avoided.

Amongst the many causes of a falling off of "revs." the following reasons are those most likely to be met with:—

Faults in (1) mixture, (2) compression, (3) ignition, (4) valve tappet clearance, (5) valve setting, (6) lubrication, (7) condition of valves (see "Compression"), (8) condition of combustion chamber, (9) plugs, (10) contact breaker gap (magneto), (11) wiring connections.

The above will be dealt with in the order in which they appear.

(1) *Mixture*.—Before assuming anything it will be well to ascertain when the engine was last used. This may (sometimes!) be found in the Engine Log. The reason for this being that an engine which has been most carefully tuned up in *hot* weather will not give the same results in the height of winter, and a change of jet will be required. Air leaks in the inlet pipe system are difficult to locate, and great care should be taken to see that all joints are dead tight, but prevention in this case is the best cure! Another point sometimes missed is that the air pressure in the fuel tank may vary enough to alter to a considerable degree the amount of petrol passing through the jet, chiefly in rotary engines, which have a hand-controlled fuel supply, although the same trouble may be experienced in carburettors having a float and needle, especially when the needle or seating is not perfect. An instance of this is readily called to mind in the action of a Gnome or mono, cutting out or partially cutting out when the machine is "banked" or "looped." The cutting out being due to excessive richness of the mixture on account of the centrifugal force acting on the fuel in the tank.

In the case of an old engine, it may occasionally be found that a slightly larger jet may be advantageously fitted, for various reasons, one of which is that a considerable quantity of air is drawn in through valve guides which have become worn.

(2) *Compression*.—Loss of compression may be due to any of the following causes: Dirty valves and

valve seatings, leaky piston rings, faulty valve springs, loose valve caps (of the inner and outer types), sparking plugs not tight, looseness being occasionally due to faulty threads, which may give a false feeling of tightness, although the copper washer is not compressed, leaks in air connections ; this, of course, only applies to engines which are started by means of compressed air. The remedies for the above are all obvious, and they are enumerated with a view to reminding the reader of the various contingencies with which he may have to contend. There are few people who have had any experience with engines, who cannot remember the moments spent in trying to think "what it can be," and a few words in black and white may bring the fault to mind at the critical moment.

(3) *Ignition*.—One of the most prolific causes of trouble with ignition is to be met with in rotary engines which have the distributor so arranged that it is a matter of the greatest difficulty to remove oil from it. It is a good plan invariably to wipe the distributor immediately on conclusion of a flight, using a series of dry cloths, remembering that petrol *does not* dissolve castor oil, but that it *may* cause distortion of the distributor ring. The writer has met with not a few cases of faulty distributor rings, in new engines and in engines which have run a very few hours. The faults are due to either faulty material or poor workmanship, and the result most often to be met with is the unevenness of the fibre and metal insets or contact pieces, the latter either projecting from, or being sunk into, the former. In both cases, the effect is to cause jumping or chattering of the carbon brush or brushes, and hence irregular firing, excessive wear and danger of fracture to the carbons. Accidental earthing of the "earth" wire to or from the switch will result in failure to obtain a current. If this is suspected, a temporary removal of the "earth" connection from its terminal on the magneto will conclusively prove if the assumption is correct or not. If this connection be removed it should be remembered that *while the wire is detached, the engine cannot be stopped* by the switch.

In rare instances nowadays a high tension (plug) wire may be found to have grounded on some part of the engine, by reason of the rubber insulation having come in contact with hot metal.

In rotary engines, the bare wires from the distributor to the plugs should never be used more than once, as by being bent or twisted they become brittle and are liable to fracture.

(4) *Valve Tappet Clearances*.—The adjustment of these clearances is of great importance, and therefore extreme care should be taken to see that the tappets are *all* evenly and accurately set. Considerable loss of power may result from carelessness in this respect. In a new engine or in cases where new valves have been put in, the clearances should be frequently checked, as, until the valves have thoroughly seated themselves, the tappet clearances alter considerably on account of the valve stems lengthening under the influences of heat and the hammering action of their motion.

#### The King and Queen at Bristol.

CERTAINLY one of the most interesting chapters in the visit of their Majesties to the West of England was the inspection of the British and Colonial Aeroplane Factory. On arrival the King and Queen were received by Mr. Samuel White, Chairman, and the Managing Director and members

(5) *Valve Setting*.—The above heading has been included, partly as an opportunity of noting that, generally speaking, handbook instructions should be rigidly observed, but that also, and this is equally important, a very considerable latitude may be allowed, under certain special conditions, and adherence to handbook instructions or precedent should not be carried to a slavish degree. It may be of interest to the reader to know that in a certain 12-cylinder vertical engine, having overhead cam shafts, which were fitted with a Vernier form of adjustment allowing infinitesimal alterations in timing, and each rocker arm (actuating the valves) mounted in an eccentric bearing, which allowed minute and independent adjustments to each valve, it was found that an extraordinary number of variations of timing could be made, and in the final "tuning up" the actual timing of each cylinder showed considerable variation when compared with the others.

(6) *Lubrication*.—Very little can be said on this subject that would be suitable for inclusion in this article. It is hardly necessary to say that every precaution should be taken to see that the lubricating system is in order and that the prescribed amount of oil is used. In rotary engines care should be taken that lubricating oil should go *into* the engine and not *on to* the outside of the cylinders. Congealed oil, burned on to the radiating fins of air-cooled cylinders may just make the difference between a cylinder "blueing" and keeping bright.

(7) *Condition of Valves*.—It is extraordinary how few air-mechanics realise what really "grinding in valves" means. Most of them are quite satisfied as long as the valve seat is bright, but pay little attention to the quality of the surface obtained. The seat and seating should be ground in in the ordinary way first, and then finished by careful grinding with ultra fine pumice powder or similar compound, until a perfectly smooth finish is obtained. This greatly increases the time that the valve will keep clean, apart from obtaining a good seating. The working of the valves will be very greatly helped by the application of some deflocculated graphite on stems and guides, and if the tops of the valves are polished and a very thin coating of this graphite applied, the deposit of carbon will be appreciably reduced. It is doubtful if the excellent qualities of the above compound are fully realised, except by very few mechanics and officers. A small amount mixed with lubricating oil has the effect of putting a face on surfaces, to be obtained in no other way. The writer has used it for some seven or eight years in a variety of aero engines and car engines with, in the latter instances, really wonderful results in oil economy.

(8, 9, 10 and 11) These subjects have been dealt with in the first part of the article under itemised headings.

The writer has for some time wished that some medium could be found for an exchange of notes, "hints," and so forth, and earnestly hopes that any omissions, errors, or the like will be pointed out to him. Correspondence will be welcomed and replied to when circumstances permit.

of the staff had the honour of being presented. Major Ivan Davson, representing the Controller of Aeronautical Supplies, and Lieutenant B. C. Bartley, Assistant Director Aeroplanes Supplies, were also presented.

Their Majesties then passed through a number of the workshops and saw the various processes of construction of Bristol aeroplanes.



# The Royal Aero Club of the United Kingdom

## OFFICIAL NOTICES TO MEMBERS

### SPECIAL COMMITTEE MEETING.

A SPECIAL MEETING of The Committee was held on Wednesday last, the 7th inst., when there were present:—Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S., in the Chair, Wing-Commander Spenser, D. A. Grey, R.N., D.S.O., Wing-Commander A. M. Longmore, R.N., Mr. J. H. Nicholson, and Mr. T. O. M. Sopwith. In attendance Lieut.-Com. H. E. Perrin, R.N.V.R.

**Election of Members.**—The following New Members were elected:—

Surgeon Henry Graeme Anderson, R.N.  
Flight-Commander Eric Bentley Beauman, R.N.  
Archie Frederick Collins.  
2nd Lieut. Robert James Cullen, R.F.C.  
Capt. Walter Leonard Clark Duff, R.F.A. (R.).  
Lieut. John Fowler, R.N.V.R.  
Lieut. Stephen Walter Godin, R.N.V.R.  
Lieut. Frederick Norton Grimwade, R.F.C. (S.R.).  
Flight-Lieut. Arthur E. Hawker, R.N.  
George Robert Hubbard.

Flight-Commander Reginald Frederick Stuart Leslie, R.N.  
Capt. William Lachlan McEwen.

Flight-Lieut. Warren Rawson Mackenzie, R.N.  
2nd Lieut. William Ewart Nuttall, R.F.C.

Vere Fane Martin Oliver, B.A.

Flight-Lieut. John Edward Maddock Pritchard, R.N.  
Arthur Edward Savill.

Lieut. Douglas Roy Verey, R.N.V.R.

Berti Arthur Waller.

Sub-Lieut. Harold Richard Grant Whates, R.N.V.R.

**Temporary Honorary Members.**—The following were elected Temporary Honorary Members of the Club:—

Commander R. Boris (French Navy).

Lieut. J. P. G. Basclain.

Lieut. H. E. Hamilton.

A. Mirtil.

Major Nicolas Moiseenko.

H. E. PERRIN, Secretary.  
3, Clifford Street, New Bond Street, W.1.

## THE ROLL OF HONOUR.

### REPORTED by the Admiralty:—

#### Killed.

F.749 Leading Mech. A. A. Housden, R.N.  
F.6479 1st Air-Mech. H. R. Robins, R.N.

**Previously Missing, now reported Killed.**  
Flight Sub-Lieut. E. J. K. Buckley, R.N.

**Previously Missing, now presumed Killed.**  
Flight Sub-Lieut. J. W. D. Cripps, R.N.  
Flight Sub-Lieut. K. Turney, R.N.

#### Accidentally Killed.

Flight Sub-Lieut. W. A. Isaacs, R.N.  
Flight Sub-Lieut. J. St. James, R.N.  
Prob. Flight Officer T. R. Weston, R.N.

#### Died of Wounds.

F.29349 Acting 1st Air-Mech. V. E. Day, R.N.

#### Died of Injuries.

Flight Sub-Lieut. G. H. Herriott, R.N.  
Flight Sub-Lieut. G. Towers, R.N.

#### Accidentally Injured.

Prob. Flight Officer F. G. B. Callow, R.N.  
Prob. Flight Officer H. I. Fryer, R.N.  
Prob. Flight Officer F. F. Garraway, R.N.  
Prob. Flight Officer V. H. Hervey, R.N.  
Prob. Flight Officer E. A. Jenkins, R.N.  
Prob. Flight Officer J. A. Smith, R.N.

#### Missing.

Flight Sub-Lieut. G. Andrews, R.N.  
Flight Sub-Lieut. H. P. Salter, R.N.  
Flight Sub-Lieut. P. G. Shepherd, R.N.  
Flight Lieut. L. G. Sieveking, D.S.C., R.N.  
Observer Sub-Lieut. H. W. White, R.N.

**Previously Missing, now reported Prisoner and Wounded.**

Flight Sub-Lieut. W. Ingleson, R.N.

**Previously Missing, now reported Prisoner.**

Flight Sub-Lieut. A. W. Phillips, R.N.

**Correction: Prisoner and Unwounded.**

Flight Sub-Lieut. J. C. Akester, R.N., should read Prisoner and Wounded.

**Reported by the War Office:—**

#### Killed.

Capt. J. C. A. Counter, Welsh, attd. R.F.C.  
2nd Lieut. G. H. Gallinger, R.F.C.  
2nd Lieut. C. H. Harreman, R.F.C.  
2nd Lieut. A. Johnston, R.F.A., attd. R.F.C.  
2nd Lieut. E. H. Keir, R.F.C.  
Lieut. A. N. Leeson, D.S.O., R.H.A., attd. R.F.C.  
2nd Lieut. A. W. McJanet, R.F.C.  
Lieut. J. H. Muller, Mx. R., attd. R.F.C.  
2nd Lieut. G. Pearson, R.F.C.  
Lieut. F. T. Wakeman, R. War., attd. R.F.C.  
Capt. C. W. C. Wassey, R. War., attd. R.F.C.

#### Accidentally Killed.

2nd Lieut. W. Hefferman, R.F.C., attd. H.A.C.  
19193 1st Air-Mech. A. J. Robb, R.F.C.

#### Previously Missing, now reported Killed.

2nd Lieut. F. T. Brasington, R.F.C.  
2nd Lieut. L. G. D'Arcy, Conn. Rang., attd. R.F.C.  
Capt. W. W. Fitzherbert, R. Suss. R., attd. R.F.C.  
2nd Lieut. J. Gagne, R.F.C.  
2nd Lieut. I. U. MacMurphy, R.F.C.  
2nd Lieut. H. Mathews, R.F.C.  
2nd Lieut. H. Smither, R.F.C.  
19789 1st Air-Mech. W. Bond, R.F.C.  
1897 1st Air-Mech. P. Bonner, R.F.C.  
89279 2nd Air-Mech. H. H. Bright, R.F.C.

#### Previously Missing, now reported Missing, believed Killed.

88285 Sergt. G. E. Lambeth, R.F.C.

**Missing, believed Killed.**  
93629 2nd Air-Mech. C. A. Blatherwick, R.F.C.

#### Died of Wounds.

2nd Lieut. J. P. Ironside, R.F.C.  
Capt. G. C. Rogers, M.C., Brit. Col. attd. R.F.C.  
2nd Lieut. J. H. Sanders, R.F.C.  
2nd Lieut. L. H. Whitfield, R.F.C.  
45057 2nd Air-Mech. W. Hayes, R.F.C.  
63190 2nd Air-Mech. F. G. Stiley, R.F.C.

#### Previously Wounded and Prisoner, now reported Died of Wounds as Prisoner in German hands.

Lieut. C. D. Hutchinson, S. Staffs., attd. R.F.C.

#### Previously Missing, now reported Died of Wounds as Prisoner in German hands.

Capt. P. W. Chambers, R.F.C.

#### Previously Prisoner, now reported Died of Wounds as Prisoner in German hands.

Lieut. E. H. Stevens, E. Lancs., attd. R.F.C.

#### Died.

49987 3rd Air-Mech. W. B. Clayton, R.F.C.  
22339 1st Air-Mech. G. Manning, R.F.C.

#### Wounded.

2nd Lieut. L. C. R. Alexander, R.F.C.  
2nd Lieut. S. St. K. Anderson, R.F.C.  
2nd Lieut. G. F. Baker, R.F.C.  
Lieut. J. Barker, R.F.C.  
2nd Lieut. F. E. Bond, R.F.C.  
Lieut. G. B. Booth, Mx. R., attd. R.F.C.  
Lieut. E. D. Clarke, R.F.C.  
Capt. A. B. Cook, R.F.C.  
Capt. I. A. J. Duff, Dorset, attd. R.F.C.  
Lieut. J. B. Fenton, Mx. R., attd. R.F.C.  
2nd Lieut. O. C. George, R.F.C.  
Lieut. G. D. A. Heys, R.G.A., attd. R.F.C.  
Capt. C. N. Jones, Sher. For., attd. R.F.C.  
Lieut. H. E. Judge, R.F.C.  
2nd Lieut. R. A. Hewat, R.F.C.

Capt. J. M. M'Alery, R.F.C.  
2nd Lieut. H. S. Malik, R.F.C.  
Lieut. E. Rhodes, R.F.C.  
Lieut. W. G. Ryan, R.F.C.

2nd Lieut. H. S. Scott, W. Yorks. R., attd. R.F.C.  
2nd Lieut. C. L. Shaw, R. Berks., attd. R.F.C.

Capt. C. J. Temperley, N. Cyc., attd. R.F.C.

The following are air-mechanics in the R.F.C. unless otherwise mentioned, the number in brackets indicating the grade:—

10819 (1st) L. Baines; 75047 (3rd) H. Burry; 11267 (1st) W. Crosby; 76929 (3rd) J. Love; 8238 (1st) J. M. McGrath; 37174 (2nd) G. W. Markwell; 9154 (1st) F. Mollett; 19776 (1st) S. Parry; 43952 (2nd) S. D. Walker; 20685 Cpl. T. Whiteside; 9874 (2nd) S. J. Luffman (R.F.C., attd. R.F.A.); 8799 (2nd) H. A. Fuller, (R.F.C., attd. R.G.A.); 48793 (2nd) A. Barham; 43970 (2nd) W. L. Finney; 43972 (2nd) W. V. D. Street; 44697 (2nd) J. J. D. Botwright; 7526 (1st) J. W. Bruce; 56626 (2nd) C. P. Furnival; 7986 (1st) M. W. Slade; 68109 (2nd) S. D. Silcox; 8898 (1st) R. C. Corwell; 8855 (1st) H. W. Hildreth; 49950 (2nd) J. H. Read; 66942 (2nd) C. O. M. Steward.

**Missing.**

2nd Lieut. L. M. Archibald, R.F.C.  
2nd Lieut. C. H. Barton, R.F.C.  
2nd Lieut. G. R. Bradley, R.F.C.  
2nd Lieut. R. A. Cartledge, R.F.C.  
2nd Lieut. F. S. Clark, R.F.C.  
2nd Lieut. J. P. Dalley, I.A.R.O., attd. R.F.C.  
2nd Lieut. W. Davidson, R.F.C.  
2nd Lieut. W. de C. Dodd, R. Mun. Fus., attd. R.F.C.  
2nd Lieut. J. A. M. Flemig, R.F.C.  
Lieut. R. J. E. P. Goode, R. Dub. Fus., attd. R.F.C.  
Lieut. R. S. Greenslade, R.F.C.  
2nd Lieut. G. R. Gray, R.F.C.  
2nd Lieut. W. H. Jones, R.F.C.  
2nd Lieut. N. H. Kemp, R.F.C.

2nd Lieut. A. W. MacLaughlin, R.F.C.  
2nd Lieut. H. L. Marvin, R.F.C.  
2nd Lieut. P. D. Montague, Rif. Brig., attd. R.F.C.  
2nd Lieut. C. A. Moore, R.F.C.  
Lieut. H. B. New, Essex, attd. R.F.C.  
2nd Lieut. C. I. Phillips, Glouc. R., attd. R.F.C.  
2nd Lieut. C. W. Primeau, R.F.C.  
Lieut. W. L. O. Parker, Hrs., attd. R.F.C.  
2nd Lieut. E. W. Powell, R.F.C.  
2nd Lieut. S. W. Randall, R.F.C.  
2nd Lieut. A. P. F. Rhys-Davids, D.S.O., M.C., R.F.C.  
2nd Lieut. E. C. S. Ringer, R. Suss. R., attd. R.F.C.  
2nd Lieut. A. W. Rush, R.F.C.  
2nd Lieut. E. D. Scott, R.F.C.  
Lieut. W. B. Sherwood, R.F.C.  
2nd Lieut. E. Smith, A.I.F., R.F.C.  
2nd Lieut. R. M. Smith, R.F.C.  
2nd Lieut. H. J. Thornton, R.F.C.  
2nd Lieut. S. L. Whitehouse, R.F.C.  
89279 2nd Air-Mech. H. H. Bright, R.F.C.  
6717 Sergt. A. O. Stanley, R.F.C.  
78979 1st Air-Mech. A. H. Wardlaw, R.F.C.

**Previously Missing, now reported Prisoner in German hands.**

2nd Lieut. F. C. Andrews, R.F.C.  
Lieut. J. W. Boumphrey, Yeo., attd. R.F.C.  
2nd Lieut. J. F. Bushe, R.F.C.  
2nd Lieut. C. G. Crane, R.F.C.  
2nd Lieut. H. T. Hammond, R.F.C.  
2nd Lieut. E. E. F. Loyd, Drag. Gds., attd. R.F.C.  
2nd Lieut. A. J. Orr-Ewing, Yeo., attd. R.F.C.  
2nd Lieut. L. M. Shadwell, R.F.C.  
2nd Lieut. W. H. Watt, Ches., attd. R.F.C.

**Correction: Previously Missing, now reported Killed.**  
2nd Lieut. R. Hayes, R.F.C., should read Lieut. R. Hayes, R.F.C.

**Aviation in Ireland.**

ACCORDING to the *Irish Independent*, active preparations are in progress at present to equip another flying school near a populous centre in Ireland. The main site chosen comprises

about 40 acres of farm land forming the summit of a high plateau; another upland site of about 20 acres a mile or two away has also been marked out, and will be used probably as an alighting station for the aircraft.



The German aeroplanes and a couple of tanks, in the Lord Mayor's Show, outside Marconi House.

# MATHEMATICAL EXPRESSIONS FOR CLIMB, RATE OF CLIMB AND CEILING OF AN AEROPLANE, WITH PRACTICAL EXAMPLE.

By E. F. C., B.Sc

THE altitude, at any time, of an aeroplane climbing at its maximum possible rate, is very nearly represented by a mathematical law similar to that for the rise of electric current in an inductive circuit. Thus if  $h$  be the altitude at a time,  $t$  and  $H$  the "ceiling" of the machine, we have the relation

$$h = H \left( 1 - e^{-\frac{t}{T}} \right) \quad (1)$$

where  $e$  is the base of the natural or Napierian logarithms and  $T$  is a time, which, by analogy with the electrical case, may be called the "time constant" of the climb, being the

time required by the altitude to become  $1 - \frac{t}{T}$

or .632 of its final value, i.e., for the aeroplane to rise to a height equal to 0.632 of its ceiling\*. Except that  $h$  and  $H$  and also  $t$  and  $T$  must be measured in the same units of height and time respectively, there is no restriction in this formula on the actual units used.

This being the case, it is possible to find expressions for the rate of climb at any time and at any altitude and also an expression for the ceiling of the machine, which latter is quite simple. We will first show how to obtain such expressions from the equation already given and afterwards will give the application of these to a practical case.

The rate of climb is obtained by differentiating  $h$  with respect to  $t$ , and is

$$\frac{dh}{dt} = \frac{H}{T} e^{-\frac{t}{T}}, \quad (2)$$

which is an equation giving the rate of climb in terms of the time, the ceiling, and the time constant  $t$ .

By eliminating the exponential  $e^{-\frac{t}{T}}$  from equations (1) and (2) we obtain an equation giving the rate of climb in terms of the altitude, the ceiling, and the time constant. This equation is

$$\frac{dh}{dt} = \frac{H}{T} \left( 1 - \frac{h}{H} \right) = \frac{H - h}{T},$$

and shows that rate of climb plotted against altitude is a

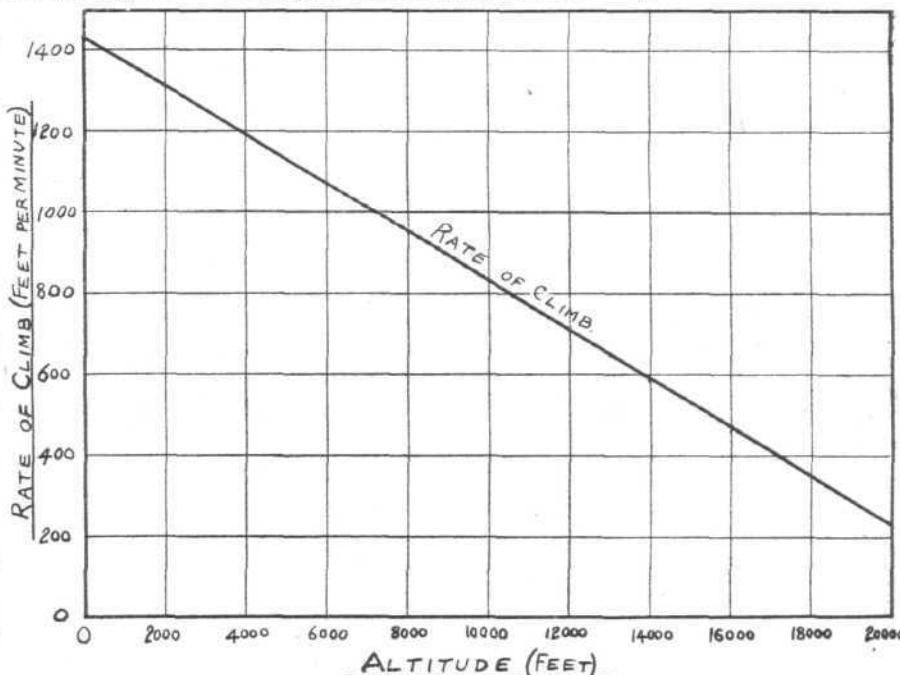
\* The time required to rise to the ceiling is mathematically infinite.

straight line. If we call rate of climb  $r$  we have

$$rT = H - h$$

$$\text{or } \frac{h}{H} + \frac{r}{H/T} = 1 \quad (3)$$

which equation shows that when  $r$  is plotted against  $h$ , the intercept ( $H$ ) of the straight line on the altitude axis is the ceiling of the machine (where rate of climb  $r=0$ ) and the intercept ( $\frac{H}{T}$ ) on the rate of climb axis is the initial rate of climb, (i.e., rate of climb when  $h=0$ ).

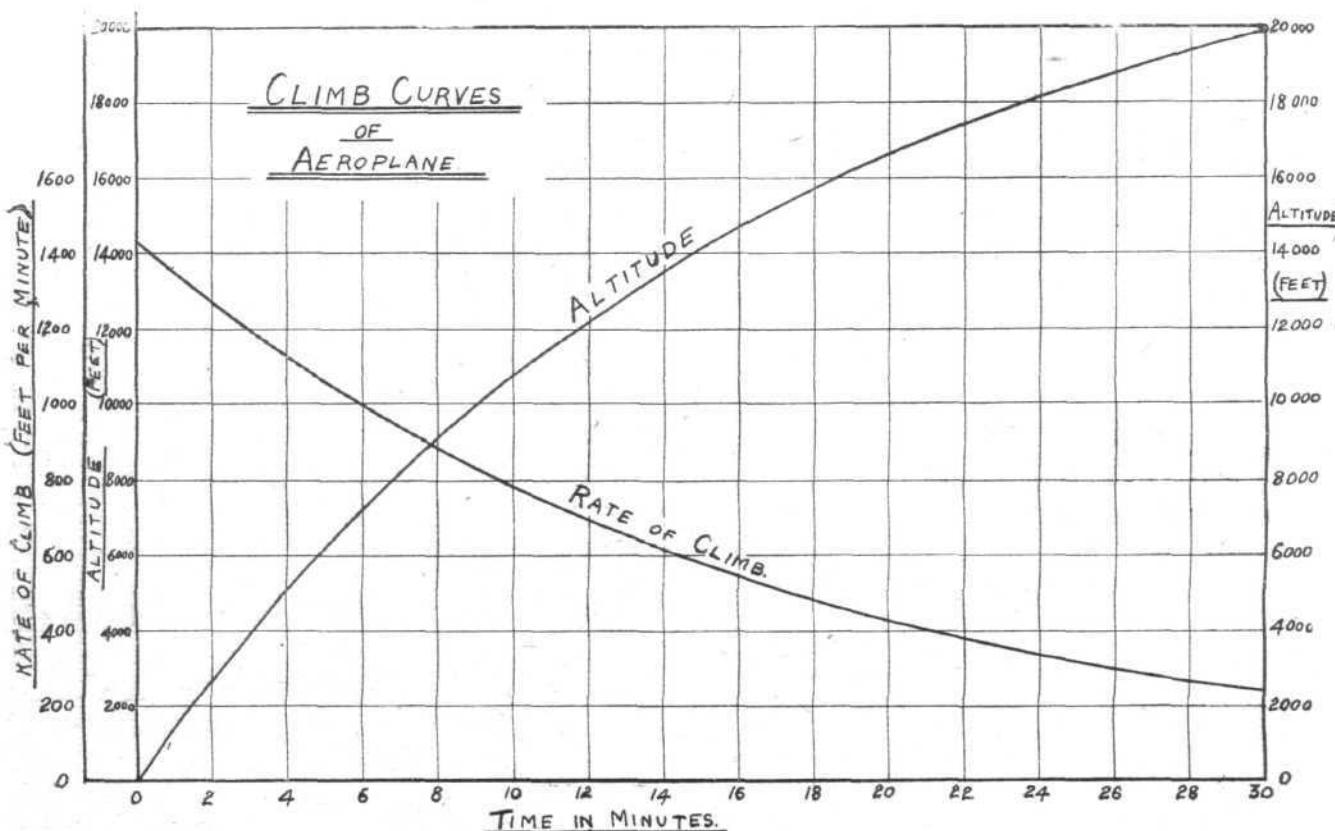


The simple expression for the ceiling of a machine is obtained as follows:—

After any time  $t$  from the start let the observed altitude of the aeroplane be  $h_1$ , and after a time  $2t$  let it be  $h_2$ . Then we have

$$h_1 = H \left( 1 - e^{-\frac{t}{T}} \right)$$

$$h_2 = H \left( 1 - e^{-\frac{2t}{T}} \right)$$



Let us write  $X$  for the exponential  $e^{-\frac{t}{T}}$  for convenience, then :—

$$h_1 = H(1 - X)$$

$$h_2 = H(1 - X^2)$$

whence by division  $\frac{h_2}{h_1} = 1 + X$

but since  $\frac{h_1}{H} = 1 - X$

$$\therefore \frac{h_1}{H} = 2 - \frac{h_2}{h_1}$$

and

$$H = \frac{h_1}{2 - \frac{h_2}{h_1}}$$

which gives the ceiling of the machine in terms of the altitude  $h_1$  at time  $t$  and the altitude  $h_2$  at time  $2t$ . (Note that  $t$  may be any time whatever during the climb.) So all we require to calculate the ceiling of a machine, is the altitude after any time, and the altitude after double that time.

We will now illustrate the foregoing analysis by a practical example. Observations of a certain aeroplane on a climb test showed the altitude to be related to the time after start according to the following table :—

Time (minutes)—

0	2.5	5.0	7.5	10.0	12.5	15.0	17.5	20.0	22.5
0	3300	6150	8730	10760	12610	14190	15530	16650	17600

The ceiling of the machine may be calculated right away taking  $h_1$  as 10760 ft. after 10 minutes and  $h_2$  as 16650 ft. after 20 minutes. We have

$$H = \frac{10760}{2 - \frac{16650}{10760}} = \frac{10760}{4526} = 23,770 \text{ feet.}$$

We may next calculate  $T$ , the time constant. The value of the exponential (which we called  $X$  for short) is (when  $t=10$  minutes)

$$X = \frac{h_2}{h_1} - 1 = .5474.$$

$$\text{hence } -\frac{10}{T} = \log e .5474$$

$$= 2.3026 \log_{10} .5474.$$

$$= 2.3026 \times 1.7383$$

$$= 2.3026 \times -.2617$$

$$\text{whence } T = \frac{10}{2.3026 \times -.2617} = 16.60 \text{ minutes.}$$

The initial rate of climb

$$= \frac{\text{ceiling}}{\text{time constant}} = \frac{23770}{16.60}$$

$$= 1432 \text{ feet per minute.}$$

Having calculated the constants of the climb, we may now write down the equations for the altitude at any time, the rate of climb at any time, and the rate of climb at any altitude. They are respectively :—

$$h = 23770 \left( 1 - e^{-\frac{t}{16.60}} \right)$$

$$r = 1432 e^{-\frac{t}{16.60}}$$

$$\text{and } r = \frac{23770 - h}{16.60}.$$

From the first two equations the altitude and rate of climb at any time  $t$  are calculable and the figures for the altitude are found to agree closely with the table already given, so far as this table goes. We give below a table calculated from these two equations, also a table showing rate of climb at various altitudes. The results are also plotted in the accompanying curves.

Time (minutes)—

0	2.5	5.0	7.5	10.0	12.5	15.0
0	3320	6180	8640	10760	12575	14140

Rate of Climb (feet per minute).—

1432	1232	1060	911	784	674	580
17.5	20.0	22.5	25.0	27.5	30.0	

Time (minutes)—

15485	16645	17640	18500	19240	19870
499	429	369	318	273	235

Altitude (feet)—

0	2000	4000	6000	80000	10000
1432	1311	1191	1070	950	829

Rate of Climb (feet per minute).—

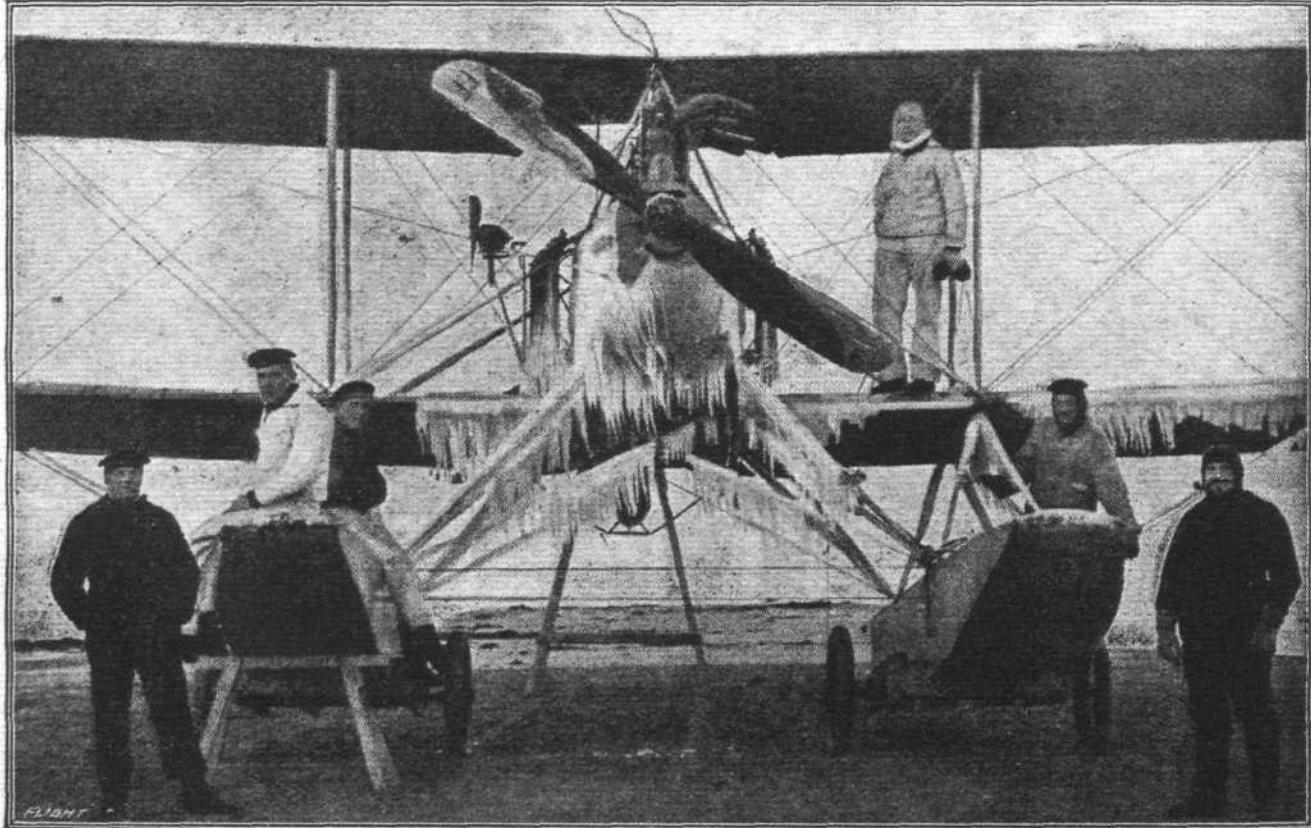
12000	14000	16000	18000	20000
709	588	468	348	227

Altitude (feet)—

0	2000	4000	6000	80000	10000
1432	1311	1191	1070	950	829

Rate of Climb (feet per minute).—

12000	14000	16000	18000	20000
709	588	468	348	227



A COLD JOB.—A German seaplane on its return from a flight over the North Sea in winter.

## THE AIR FORCE BILL.

THE following is the text of the Air Force Bill, introduced by Mr. Walter Long in the House of Commons on November 8th, which provides for the establishment, administration and discipline of an Air Force, and the establishment of an Air Council:—

## PART I.—ESTABLISHMENT OF AIR FORCE.

1. It shall be lawful for His Majesty to raise and maintain a force, to be called the Air Force, consisting of such number of officers, warrant officers, non-commissioned officers and men as may from time to time be provided by Parliament.

*Government Discipline and Pay.*

2.—(1) Subject to the provisions of this Act it shall be lawful for His Majesty, by order signified under the hand of a Secretary of State, to make orders with respect to the government, discipline, pay, allowances and pensions of the Air Force, and with respect to all other matters and things relating to the Air Force, including any matter by this Act authorised to be prescribed or expressed to be subject to orders or regulations.

(2) The said orders may provide for the formation of men of the Air Force into separate units, and for the formation of such units into corps, and for appointing, transferring, or attaching men of the Air Force to units, and for posting, attaching, and otherwise dealing with such men within the units, and may regulate the appointment, rank, duties, and numbers of the officers and non-commissioned officers of the Air Force.

(3) Subject to the provisions of any such order, the Air Council hereinafter constituted may make general or special regulations with respect to any matter with respect to which His Majesty may make orders under this section: Provided that the administration of pensions, other than service pensions within the meaning of the Ministry of Pensions Act, 1916, shall vest in the Minister of Pensions.

(4) All orders and general regulations made under this section shall be laid before Parliament as soon as may be after they are made.

*Transfer and Attaching to Air Force.*

3.—(1) Any officer, warrant officer, petty officer, non-commissioned officer, or man of any of His Majesty's Naval or Military Forces may, with his consent and subject to the approval of the Admiralty or Army Council (as the case may be), be transferred by the Air Council to the Air Force, or attached by the Air Council to the Air Force for the period of the present war or for a period not exceeding four years:

Provided that—(a) any officer, warrant officer, petty officer, non-commissioned officer, or man who at such date as may be fixed by Order in Council belongs or is attached to the Royal Naval Air Service, the Royal Flying Corps, or any unit of the naval or military forces engaged in defence against aircraft which is designated by the Admiralty or Army Council for the purpose, may be so transferred or attached without his consent, but if any person so transferred or attached, within three months from the time when he receives notice of such transfer or attachment or such longer period as in any particular case the Air Council may allow, gives notice to his commanding officer that he does not desire to be so transferred or attached, the transfer or attachment shall be annulled without prejudice to the validity of anything which may have been done in the meanwhile; and

(b) No person transferred to the Air Force under the provisions of this section shall be liable to serve with the Air Force for any longer period than that for which he would have been liable to serve had he continued in the force from which he was transferred.

(2) Regulations made by the Air Council may provide that in the case of a person so transferred, the time during which he held a commission or served in the force from which he is transferred shall, for such purposes as may be prescribed, be aggregated with the time during which he holds a commission or serves in the Air Force, and that his entry into or enlistment in the force from which he is transferred shall, for such purposes as may be prescribed, be treated as enlistment into the Air Force.

(3) Where any person is transferred to the Air Force under this section, then for the purposes of pay, pensions, gratuity, and retired or half-pay, and of any decoration or reward dependent on length of service, any previous service with His Majesty's naval or military forces which would have counted as service towards pay, pension, gratuity, retired or half-pay, or such decoration or reward if he had not been so transferred, shall be deemed to be service with the Air Force towards pay, pension, gratuity, retired or half-pay, or such decoration or reward.

(4) Where any person is attached to the Air Force under this section, the fact that he is so attached shall not affect any right to any pay, pension, gratuity, retired or half-pay, or such decoration or reward as aforesaid, already earned by him in that branch of His Majesty's naval or military forces to which he belonged at the date on which he was so attached, and the period during which he is so attached shall, for the purpose of any provisions relating to pay, pensions, gratuity, retired or half-pay, or such decoration or reward, be deemed to be service with that branch of His Majesty's naval or military forces to which he belonged at the date on which he was so attached.

*Rights of Officers.*

4. Officers in the Air Force shall enjoy all such powers, rights, immunities, and privileges as are enjoyed by commissioned officers of His Majesty's Navy or Army as such, whether conferred by statute or otherwise, and the acceptance of a commission in the Air Force shall not render a person accepting such a commission incapable of being elected to or sitting or voting in the Commons House of Parliament, and nothing in the Succession to the Crown Act, 1707, shall extend to any member of the Commons House of Parliament who, being an officer of the Air Force, receives any new or other commission in the Air Force, or receives a commission in His Majesty's Navy or Army, or who, being an officer in His Majesty's Navy or Army, receives a commission in the Air Force.

*Application of Military Service Acts.*

5.—(1) Any men who, by virtue of the Military Service Acts, 1916 and 1917, are deemed to have been enlisted in His Majesty's Regular Forces and to have been transferred to the reserve, or who, having voluntarily enlisted in the Regular Forces, have been so transferred, shall, on being called up for service, be liable to be transferred to the Air Force.

(2) There shall be included amongst the exceptions mentioned in the First Schedule to the Military Service Act, 1916, the following:—Men serving in the Air Force.

*Air Force Reserve.*

6.—(1) It shall be lawful for His Majesty to raise and maintain an Air Force Reserve and an Auxiliary Air Force consisting in each case of such number of officers, warrant officers, non-commissioned officers, and men as may from time to time be provided by Parliament, and to provide for the transfer or attachment to the Auxiliary Air Force, subject to their consent, officers and men of any unit of the Territorial Force which at the passing of this Act forms part of the Royal Flying Corps.

(2) His Majesty may, by Order in Council, apply with the necessary adaptations to the Air Force Reserve, or to the Auxiliary Air Force, or to the officers or men of any such force, any enactment relating to the Army Reserve or to the Territorial Force or to the officers or men of those forces, and such Order in Council shall be laid before both Houses of Parliament.

*Consequential Amendments.*

7. The amendments set out in the second column of the tables in Part I and Part II of the First Schedule to the Act (being amendments consequential on the establishment of an Air Force) shall be made in or inserted after the provisions of the Naval Discipline Act and the Army Act respectively mentioned in the first column of those tables, and section two of the Naval Discipline Act, 1917 (which relates to the printing and construction of the Naval Discipline Act), shall apply to the amendments of the Naval Discipline Act made by this Act in like manner as it applies to the amendments thereof made by that Act.

## PART II.—ESTABLISHMENT OF AIR COUNCIL.

8.—(1) For the purpose of the administration of matters relating to the Air Force and to the defence of the realm by air there shall be established an Air Council consisting of one of His Majesty's Principal Secretaries of State, who shall be President of the Air Council, and of other members who shall be appointed in such manner and subject to such provisions as His Majesty may by Order in Council direct.

(2) His Majesty may by Order in Council fix the date as on which the Air Council is to be established, and make provision with respect to the proceedings of the Air Council and the manner in which the business of the Council is to be distributed among the members thereof.

(3) On the establishment of the Air Council the Air Board constituted under the New Ministries and Secretaries Act, 1916, shall cease to exist, and all the powers, duties, rights, liabilities, and property of that Board shall be transferred to the Air Council, but nothing in this sub-section shall affect

any orders, instructions, or other instruments issued by the Air Board, and all such instruments shall have effect as if issued by the Air Council.

(4) His Majesty may by Order in Council transfer from the Admiralty, or from the Army Council, or the Secretary of State for the War Department, to the Air Council or the President of the Air Council such property, rights, and liabilities of the Admiralty or Army Council or Secretary of State as may be agreed between the Air Council and the Admiralty or the Army Council, as the case may be.

*Staff, Remuneration, and Expenses.*

9.—(1) The Air Council may appoint such secretaries, officers, and servants as the Council may, with the sanction of the Treasury, determine.

(2) *There shall be paid, out of moneys provided by Parliament, to the members of the Air Council, and to the secretaries, officers, and servants of the Council, such salaries or remuneration as the Treasury may determine.*

*Style, Seal, and Proceedings.*

10.—(1) The Air Council may sue and be sued, and may for all purposes be described by that name.

Sub-sections 2 to 5 deal with official seal and matters of evidence in legal proceedings.

*Sitting in Parliament.*

11.—(1) The number of Principal Secretaries of State and Under-Secretaries capable of sitting and voting in the Commons House of Parliament shall be increased to five, and accordingly section four of the Government of India Act, 1858, and section one of the House of Commons (Vacation of Seats) Act, 1864, shall have effect as if the word "five" was substituted for the word "four" wherever that word occurs in those sections. Provided that nothing in this provision shall affect the operation of section nine of the new Ministries and Secretaries Act, 1916, so long as that section continues in force.

(2) In addition to the Under-Secretary of State, one of the Secretaries to the Air Council shall not by virtue of his office be incapable of being elected to or of voting in the Commons House of Parliament.



**The P.M.G. and Aerial Posts.**

SPEAKING at a meeting of the Rowland Hill Memorial and Benevolent Fund, the Postmaster-General, Mr. Albert Illingworth, M.P., said the possibility of abolishing the penny post had been under consideration. He did not, however, wish his name to be connected with such a retrograde step if it was possible to avoid it, but rather with making advances,

**PART III.—DISCIPLINE, &c.**

12.—(1) The Army Act as in force immediately before the passing of this Act shall, subject to the modifications set out in the Second Schedule to this Act (being amendments required to adapt that Act to the circumstances of the Air Force), apply with respect to the Air Force, and shall, as so modified, take effect as a separate Act of the present session of Parliament, and may be printed as a separate Act by the printers to His Majesty and intituled "An Act to provide for the Discipline and Regulation of the Air Force," and that Act may, subject to any modifications which may from time to time be made therein, be cited as the Air Force Act: Provided that, for the purposes of section eighty-eight of the Air Force Act (relating to the continuance of men in Air Force service in case of emergency), the proclamation issued under section eighty-eight of the Army Act on the outbreak of the present war shall have effect as if it had been issued under the first-mentioned, as well as the last-mentioned, section, and had applied to the Air Force as well as to the Army.

(2) The Air Force Act shall continue in force only as long as the Army Act continues in force.

Sub-sections 3 to 5 deal with the future amendments to the Army Act and consequential amendments to the Air Force Act.

*Application of Other Acts.*

13. His Majesty may by Order in Council apply, with the necessary modifications and adaptations, in relation to the Air Council, the President of the Air Council, and the Air Force, and the officers and men thereof, and Air Force property or institutions, any of the enactments relating to the Army Council, the Secretary of State for the War Department, the Army, or the officers and soldiers thereof (including enactments conferring any powers, rights, exemption, or abatement from taxation or immunities, or imposing any duties or disabilities on such officers or soldiers), or to military property or institutions, and every such Order in Council shall be laid before both Houses of Parliament.

**PART IV.—SHORT TITLE.**

14. This Act may be cited as the Air Force (Constitution) Act, 1917.



in extending the activities of the Post Office in other directions. He was quite sure there were many directions—such as aerial posts—in which extension was possible without in any way interfering with private enterprise. It was intended, as soon as the military position would admit, to institute international aerial posts between London and the various principal capitals of Europe.



**In the Hands of the Enemy.**—A Handley-Page biplane shot down in Flanders by anti-aircraft guns. The machine, according to *Flugsport*, had a crew of three and carried sixteen bombs, each weighing 50 kilogs.



## FROM OTHER LANDS.

### MEASURING DISTANCES BY MEANS OF PRISMATIC BINOCULARS.\*

THERE are already in existence numerous ingenious instruments for measuring distances. Frequently, however, it is desirable to estimate a certain distance with a fair amount of accuracy, and by the simplest means possible. This is not always an easy matter, especially in unfamiliar surround-

tured which are calibrated according to the purpose for which they are intended. Thus Fig. 1 shows a disc for use by infantry, Fig. 2 one for pioneers, and Fig. 3 a disc for use by artillery.

Suppose it is desired to find the distance from the observer

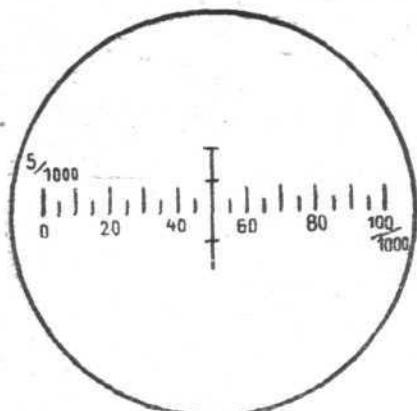


Fig. 1.

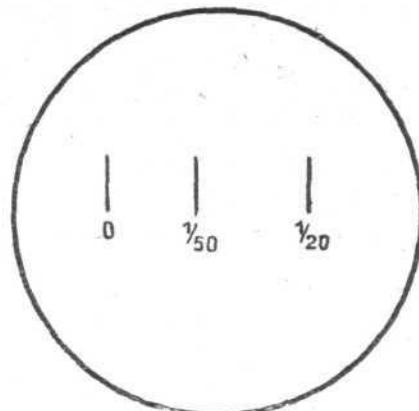


Fig. 2.

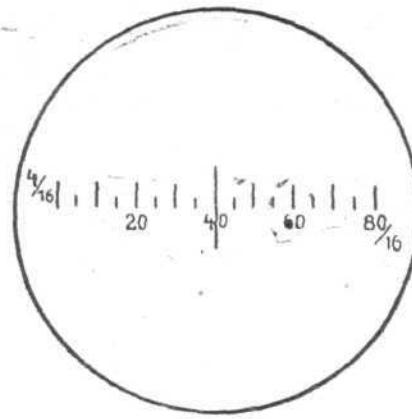


Fig. 3.

ings, and only after long practice will such estimates turn out comparatively accurate. An instrument which is of great assistance in judging distances is the prismatic form of binoculars when provided with a calibrated disc.

These discs enhance the already many-sided utility of the prismatic binoculars, and offer the further advantage that they do not in the slightest interfere with the view when the

to the airship "Schwaben," shown in Fig. 4. On the calibrated disc it is seen that the airship covers a length of 65/1000. (Lines 20 to 85.) As it is known that the length of the "Schwaben" is 146 meters, its distance from the observer is  $\frac{146 \times 1,000}{65} = 2,246.15$  metres. In Fig. 5 the distance to the house is 550 metres. The house is shown on the disc to

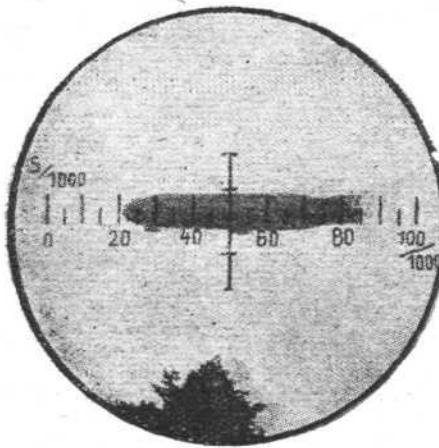


Fig. 4.



Fig. 5.



Fig. 6.

binoculars are used for the purpose for which they were originally designed. The calibrated disc, which consists of a thin glass plate with the divisional lines marked on it, is placed in the right-hand barrel. By means of the disc the distance to an object of known dimensions can be ascertained, or, conversely, if the distance be known the dimensions of the object can be found. Discs are now manufac-

\* "Motor," Berlin.



#### Long Flight in South Africa.

CAPTAIN MILLER, D.S.O., has accomplished a flight from Cape Town to Port Elizabeth within five hours. He came down once owing to a damaged propeller. The distance from Cape Town to Port Elizabeth in a straight line is 300 miles.

#### Labour Wanted for Aviation.

SPEAKING at Plymouth on November 11th Sir Auckland Geddes, Minister of National Service, said that next to maintaining our armies in the field we have to maintain our air service.

Later, he said what he did want at present was a steady supply of labour to build aerodromes. For the moment we were not seriously short of male hands for anything else in civil life; but men to build aerodromes were wanted in considerable numbers. If there be any man who was competent to lay bricks, or whatever it may be in connection with aerodrome construction, who was not engaged on Government

be 20/1,000 high. Its height is therefore  $\frac{20 \times 550}{1,000} = 11$  metres.

In Fig. 6 the width of the house is known to be 30 metres. On the disc the house is seen to be 65/1,000 wide. The distance to the house is therefore  $\frac{30 \times 1,000}{65} = 461.5$  metres.



work, let him get into touch with the nearest employment exchange, and get on to an aerodrome job. No civil building job is really of any importance in comparison with aerodrome construction at the present time.

There were to-day vacancies for, roughly, 10,000 men on really urgent Government work. The nearest employment exchange manager could give exact particulars of the jobs, of the terms upon which any man could be enrolled as a war work volunteer. It was quite easy to find work of national importance and qualify for the second degree of National Service. He definitely appealed for 10,000 men for aerodrome work, for Admiralty work, for munitions work, and directed his appeal to men not fit to qualify for the third degree of National Service.

Aeroplane factories also want hands, male and female. Thousands of women, who, a few months ago, had no knowledge of any sort of work except domestic work, hat-making, or embroidery, were now making aeroplanes. The way to the nearest employment exchange was easily found. That was the way to work of national importance.

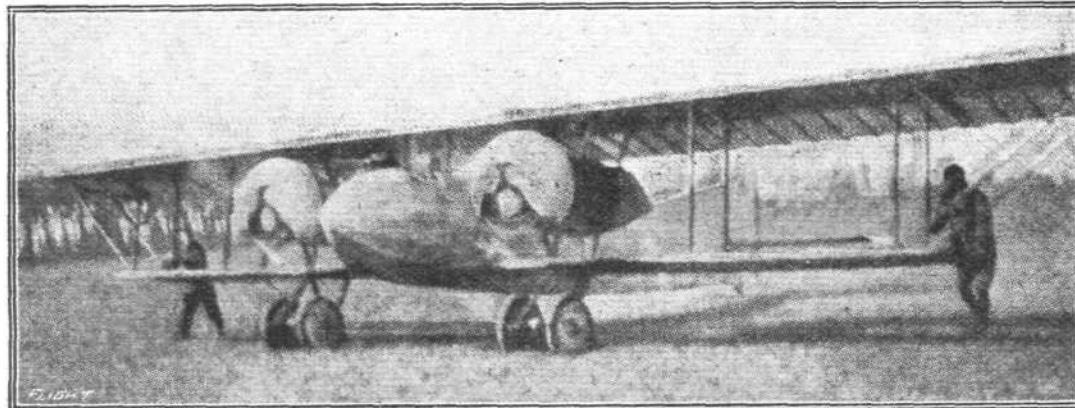


# AIR RIGS FROM THE FOUR WINDS

LORD NORTHCLIFFE'S return from America on Monday synchronised with the introduction in Parliament of the Air Force Bill. Lord Northcliffe has very pronounced views upon the methods and progress he witnessed in the United States, in aeroplane construction.

Hill Memorial Benevolent Fund at the Mansion House, that aerial posts would be instituted between London and the capitals of Europe, after the war.

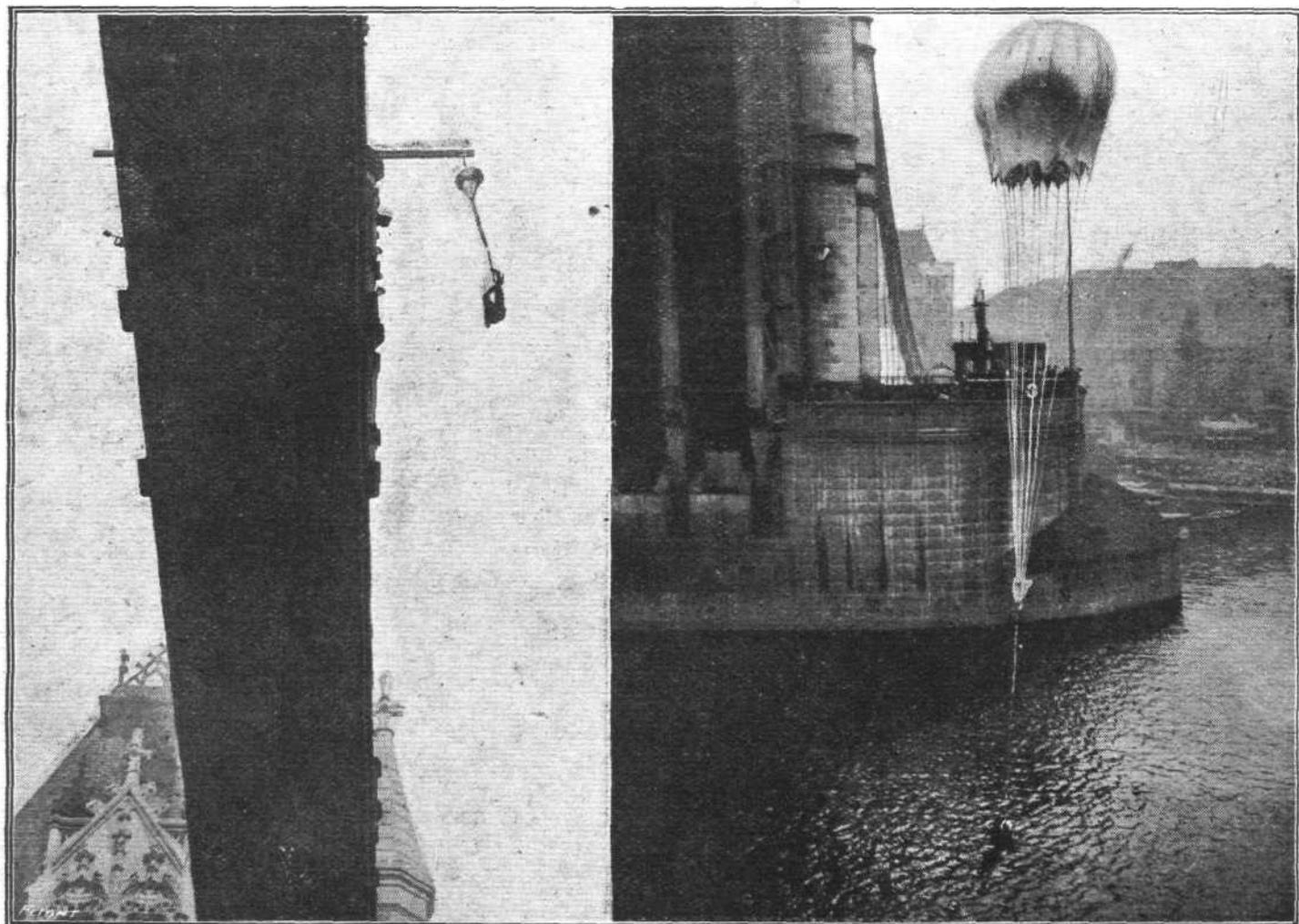
MR. JUSTICE DARLING'S spontaneous wit and caustic criti-



Courtesy, "Aerial Age," U.S.A.  
The French Caudron "G 6" twin-engine fuselage biplane.

ANOTHER "mile-stone" in sight for aviation, with the official pronouncement by Mr. A. Illingworth, M.P., Postmaster-General on Monday at the meeting of the Rowland

cism of passing events was once again well exemplified during his speech at the Law Courts upon the presentation of the new Lord Mayor. He suggested that if it was desired

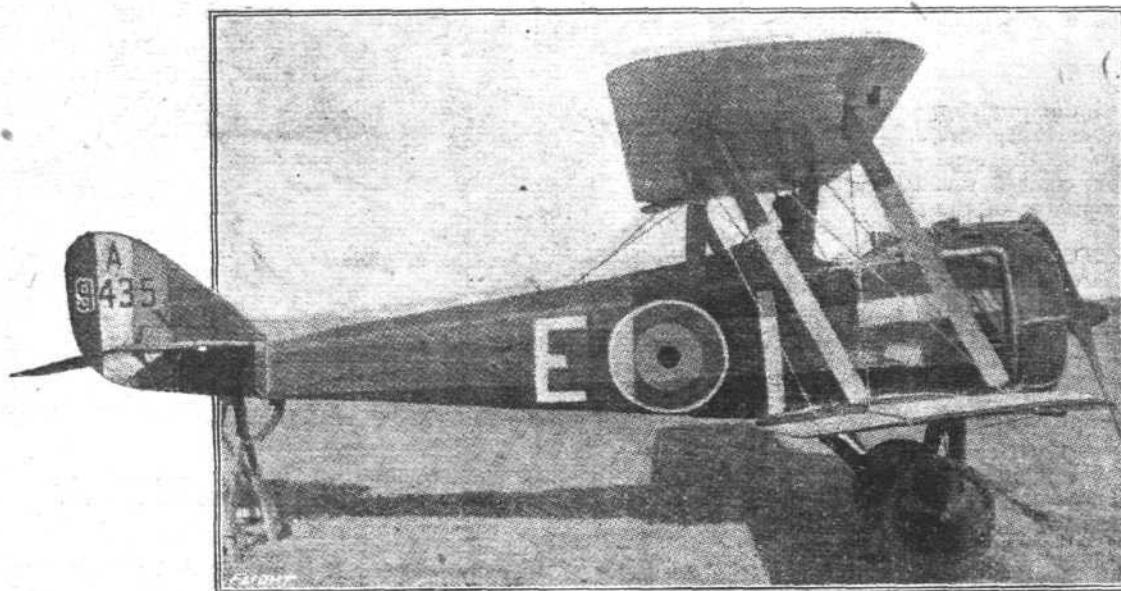


Testing the "Guardian Angel" parachute. On Sunday last tests were made with the "Guardian Angel" parachute, which is the invention of Mr. Everard Calthrop, an aviator taking the 175 ft. drop, from a beam projecting from the top stage of the Tower Bridge, to the water. Our pictures show the "plunge" from the top of the Tower Bridge; and, on the right, "landing" on the water.

to keep the Kaiser's memory green the authorities should leave untouched some places which would display the ruin wrought by the Germans who invaded this country from the air. Should any motto be required to explain what the monument was, he suggested that which served in St. Paul's to preserve the memory of Sir Christopher Wren.

THE epitaph on the Wren commemorative tablet in the cathedral reads: "Si monumentum requiris, circumspice." (If you seek his monument, look around.)

*Apropos* our own Postmaster-General's predictions as to postal aviation in the days to come it is of interest to note that in the German papers are reproduced reports from the Danish Press, according to which the plans for "air traffic on a large scale after the war are rapidly approaching completion." Malmö (Sweden) is to be one of the main stations of this international "air line." Eventually there is to be a daily aeroplane service from Malmö to Stockholm, a distance to be covered in five hours. After the war there is to be a Copenhagen-Berlin and a Stockholm-Petrograd line. In



A de Havilland biplane. The top plane, it will be seen, is staggered backwards.—*Flight sport.*

It was bound to come, of course, but the credit for the first suggestion must apparently go to the Attorney-General. Speaking at the Lord Mayor's banquet he said that he would predict that in future when the toast of the Military Services was proposed a reply would be invited not only from the Admiralty and the War Office but from the Air Service.

THE creation of the "Supreme Political Council of the Allies" for the whole of the western front and of a single British army force have come none too early. Belated as both are, it may still be in time to save the situation and finally rescue the world for all time from the pall of Prussian militarism, which for so many years has threatened the domination and slavery of the rest of the world.

PUNCH Almanack for 1918 just comes in time this week, to brighten up one's spirits these "horrid dem'd demp" November days. As usual, the most prominent idiosyncrasies

Berlin (according to the same Swedish reports) a joint stock company with £1,500,000 capital was recently formed for establishment of an air service between Berlin and Constantinople.

THE difference in sound between the enemy and the friendly aeroplane is unmistakable, according to a critical night listener. He avers that the long-drawn drone, sustained and continuous as the hum of bees among flowering limes, announce the presence of our aeroplanes. The German engines are jerkier, and seem more suited to the name children give to a train—puff-puff.

Maybe, but we cannot help thinking that this "critical night listener" has hardly heard the Hun strafes to the best advantage.

WHAT a magnificent snub the South Wales Miners have, by their voting against "downing tools," inflicted upon the



A de Havilland biplane, brought down in an air fight.—*Flugsport.*

of the times are hit off to a nicety, and a suggestive "note" is struck in the inside frontispiece which depicts "Mr. Punch and Toby riding the wind in a gun-bus equipped for the occasion with a pencil in place of the orthodox Lewis, what time they distribute Almanack leaflets to a grateful world below. On the cover Mr. Punch, bless him, is painting a 1918 pound bomb in red, with the legend, "To Kaiser Bill with comp." May it reach its mark!

pacifist traitor. Judging by the numbers, it may well be that the minority is built up of the crowd of "patriots" who, when conscription looked like becoming an accomplished fact, suddenly cultivated a yearning passion for our national industry, coal mining. Even in the elapsed period, these "foreigners" can hardly claim to have become experts, and probably they will form the first section, and rightly, too, for the combing-out process. The real miners have a well-balanced

view of the affairs of the war, as can easily be read into their pit-head resolution in which they single out the R.F.C. as if by intuition of a third service. Their views thus expressed are "That we place on record our deep sense of gratitude and appreciation for the noble and self-sacrificing work of our boys in the Army, the Navy, the Royal Flying Corps, and all parts of the great war; that we are determined to support them by all the means in our power to bring this war to a victorious conclusion."

A worthy finish to the voting.

ONE hears a good deal of the profiteer of to-day, but, by way of curiosity, we should like to have a view of the type for whom the £5 "big, fat cigar" was invented. Perhaps the proprietor of the West-End Automobile Co., who endeavoured to induce an R.F.C. officer to try one and thereby got himself entangled with the Prevention of Corruption Act, plus "Dora," may be able to engineer an introduction for us.

#### TEN YEARS AGO.

*Excerpts from the "Auto." ("FLIGHT's" precursor and sister Journal) of November, 1907. "FLIGHT" was founded in 1908.*

#### THE GERMAN MILITARY AIRSHIPS.

On Friday of last week, Kaiser Wilhelm inspected for the first time the two German military airships, the "Gross" and the "Parseval," at the Tegel Aeronautical Station. Both craft sallied forth from their hangars and executed several manœuvres at a height of about 465 ft. The Kaiser, who, it is stated, was hitherto somewhat of a sceptic in regard to dirigible balloons, expressed himself very emphatically in regard to a favourable view for the future of this type of craft.

#### NEW BRITISH ARMY AIRSHIP.

A successor to "Dirigible No. 1" is being constructed apace in the balloon factory at Farnborough, and should, if it comes up to expectations, be an altogether more promising machine than its predecessor. The gas-vessel is to have a capacity of 64,000 cubic feet, and will be 42 ft. at its greatest diameter. This will give a lifting power of 4,800 lb., which is about 1,400 lb. more than was available from "Nulli

#### FRANCE.

*Aspirant pilote sportif reconnu par la Fédération Aéronautique Internationale pour la France, certificat que*

*Mr Guynemer*

*le 22 Decembre 1916*

*ayant rempli toutes les conditions imposées par la F.A.I. a été délivré*

*Pilote Aviateur*

*le date de 1. Janvier 1917*

*Le Directeur*

*ADMIRAL*



*Portrait de l'as Guynemer*

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The above pilot's certificate was, according to *Flugsport*, found on the French Ace Guynemer, who was killed a little time ago.

Secundus." In calm weather it is anticipated that a speed of 40 miles an hour will be attained, the engines being capable of developing 100 h.p. It is anticipated that six passengers instead of three will be safely carried by the new airship, which is to be so constructed as to remove all liability of its becoming water-logged in the same way as did "Dirigible No. 1" when it terminated its remarkable journey to London at the Crystal Palace.

#### U.S. ARMY TO HAVE A DIRIGIBLE.

For some considerable time past the United States War Department have been experimenting with ordinary balloons, and they have now, it is reported, decided to construct a dirigible balloon. It is proposed that the gas-vessel should be 190 feet long and have a capacity of 50,000 cubic feet, while the propellers are to be driven by two 120 h.p. French motors, which, according to the calculations, should drive the airship at a speed of 35 miles an hour.



#### FATAL ACCIDENTS.

AN inquest was held on November 6th in Middlesex on 2nd Lieut. D. C. Bispham, R.F.C., who was killed on November 4th. According to the evidence it was his second flight alone, and in trying to land he got into a heavy mist. The machine came to the ground, but was not badly damaged, and the lieutenant's body was picked up about 40 feet away. A verdict of "Accidental Death" was returned.

At a South Coast town on November 6th, an inquest was held on Lieut. C. Jackson, R.F.C., whose body was found in the Channel with the wreckage of his aeroplane. Lieut. Jackson, with another officer as pilot, went out for practice on November 5th. A verdict was returned of "Found Dead in the Sea," death being due to injuries and drowning.

A fatal flying accident occurred at a North Wales aerodrome on November 7th. Preparing to descend, Lieut. R. H. Carter, R.F.C., stopped his engine and was circling over the aerodrome when a gust of wind upset the machine, which fell and was wrecked. Lieut. Carter was thrown against a wall and killed, but Corp. Harold Smith, who was with him, escaped with a severe cut.

Lieut. R. J. Moore, R.F.C., while carrying out a flight, fell into the Channel, and was killed.

Lieut. Leduc, R.F.C., was killed in Kent on November 7th while making an instruction flight.

An inquest was held on November 8th on Flight Sub-Lieut. G. H. Heriot, of the R.N.A.S., who was killed by falling into the sea off the South-East Coast while testing a single-seater machine. A witness of the accident stated that the pilot attempted to turn the machine whilst travelling slowly

and fell. He was found floating near the aeroplane, but he died two hours later from concussion of the brain. The jury returned a verdict of "Accidental Death."

Lieuts. Croker and Price, flying near Rugby on November 8th, fell about 300 ft. and sustained fatal injuries.

A collision between two single-seater aeroplanes occurred on November 11th over Wallington, as a result of which two R.F.C. officers were killed. The machines were flying in company at a great height when the collision occurred. One of them fell immediately, but the other appeared to right itself, and it was descending when, apparently, the propeller came off and the machine crashed to the ground. One of the machines fell in a school yard and the other in a private garden.

Lieut. A. J. Moore, a Canadian, aged 22, attached to the Royal Flying Corps, was killed while flying near Montrose. While at a high altitude an explosion took place, and the machine fell to the ground.

An inquest was held at Minster, Thanet, on November 11th, on Sub-Lieut. David Ross Kerr, R.N., who was killed on the previous day while flying. The evidence showed that when at a height of 3,000 feet his machine began to spin. The airman recovered control about 1,500 feet from the ground, but another spin began immediately afterwards, and the machine fell. It was stated that the aeroplane was in good order. The jury returned a verdict of "Death from Misadventure."

A verdict of "Accidental Death" was returned on November 11th at an inquest on the body of Lieut. D. A. Robertson, R.F.C., who was killed.

# Personals

## Casualties.

Second Lieutenant ROLAND STUART ASHER, R.F.C., who has been killed, was the only son of Mr. and Mrs. A. G. G. Asher, 2, Belford Park, Edinburgh. Educated at Horris Hill and Winchester he was gazetted in August, 1916, and had been at the front about seven months. He was nineteen years of age. His father was the famous Oxford cricket, Rugby, and athletic Blue of the early 'Eighties, the partner of Alan Rotherham at half-back in the great Oxford Fifteens captained by Harry Vassall and William M. Tatham.

Second Lieutenant GORDON SALLNOW COSGROVE, R.F.C., who was killed whilst flying on duty on November 4th, was the fourth son of W. O. and E. R. Cosgrove. Educated at Merchant Taylors' School, Scholar-elect of St. John's College, Cambridge.

Lieutenant ANDREW JOHNSTON, R.F.C., who is reported killed, was the son of Captain Fowell Buxton Johnston (formerly 3rd Dragoon Guards) by his second wife, a sister of Sir R. Chalmers. He was nephew of Mr. Andrew Johnston, the first chairman of the Essex County Council. Born in 1897, he was educated at Bedales School, Petersfield, entered Woolwich in December, 1914, received a commission in the R.F.A. in October, 1915, sailed for Egypt in December, and six months later was sent to Salonica. In July, 1916, he was invalided home, but returned to his battery at the front at Christmas, and last July came home to train for flying. On September 16th he returned to the front, where he took part in several fights in the air, in one of which, with three other machines, he encountered 15 Germans. On his last flight he had been up as an observer for three hours, and when preparing to alight seems to have been caught in an eddy. The machine plunged, and Lieutenant Johnston was killed instantly.

Second Lieutenant ARTHUR WILLIAM McJANET, R.F.C., who was killed in action on October 31st, aged 26, was the fourth son of James McJanet, East London, South Africa, and Mrs. McJanet, Bedford.

Second Lieutenant ROBERT HAROLD RICHARDSON, London Regiment and R.F.C., who was killed in action on November 6th, aged 25, was the son of Lieut.-Colonel and Mrs. T. W. Richardson, 104, Tollington Park, N. 4.

Second Lieutenant THOMAS VICTOR WALTER WALLACE, Hampshire Regiment, youngest son of Mr. Edward Alford Wallace, of Weavers' Hall, Basinghall Street, E.C., and Mrs. Wallace, of Mount View Road, Crouch Hill, N., died of wounds on November 2nd, aged 20. Three other brothers hold commissions, one having been twice wounded in France. He first joined the R.F.C., and at his own request was transferred to a line regiment. After training in the south of Ireland, he was given a commission in the Hampshire Regiment, and left for the front last July.

Second Lieutenant DAVID CHARLES BISPHAM, who was accidentally killed whilst flying in England, aged 19, was the only son of Mrs. David Bispham.

Flight Sub-Lieutenant REGINALD DENNIS CLIVE, R.N., who died on November 10th as the result of a flying accident at Edinburgh, was the elder son of Henry Reginald and Lydia Emily Clive, of Fieldgate Lawn, Kenilworth. He was aged 19 years.

Captain HENRY HALL GRIFFITH, R.F.C., killed in an aeroplane accident, was second son of Alderman A. F. Griffith and Mrs. Griffith, of Montpelier Road, Brighton, and a grandson of the late Rev. Dr. Griffith, formerly Principal of Brighton College. The gallant officer entered the Army in June, 1916, and obtained his commission in the R.F.C. in the following August. He served in France for some time. A younger brother was killed in the naval engagement off Jutland.

Second Lieutenant RAYMOND SYLVESTER LEVENTON, R.F.C., was the elder son of Mr. and Mrs. Herbert Leventon, of Huyton, near Liverpool, and was born in 1898, and educated at Greenbank School, Liverpool, and Mostyn House School, Parkgate. He began his military training at Christ Church, Oxford, last February, was appointed to the R.F.C., obtained his commission in May, and received his "wings" and pilot's certificate in August. He should have proceeded with his squadron to the front last week. He was flying over the sea on November 5th, when his machine appeared to collapse

suddenly, owing to the breaking of a wing, and he and his observer fell into the sea with the wreckage of the aeroplane.

Second Lieutenant COURTENAY PATRICK FLOWERDEW LOWSON, Rifle Brigade, attached R.F.C., the elder son of Mr. J. G. Flowerdew Lowson, of Edinburgh, was killed in an aeroplane accident on November 3rd, aged 20. He was educated at Boxgrove School and Winchester, and qualified for Christ Church College, Oxford, but owing to the war did not take up residence. He passed through Sandhurst, where he was made under-officer. On leaving Sandhurst in December, 1915, he was gazetted to the Rifle Brigade, and was immediately afterwards attached to the R.F.C. He went to the front as an observer in March, 1916, and did much photographic work. He was present at the Battle of the Somme. After taking out his pilot's certificate he was made an instructor in flying.

Second Lieutenant ALBERT CECIL TALLENT, R.F.C., who was killed while flying at Shrewsbury on November 4th, aged 21 years, was the only son of the late A. C. Tallent, and Mrs. Tallent, of 37, Lordship Park, Stoke Newington, London, N.

Flight Sub-Lieutenant GRANTHAM TOWERS, R.N.A.S., who has died as the result of a flying accident, was the only son of the late Robert Mason Towers, Bengal Civil Service, and Mrs. Towers, of The Old Vicarage, Stapleford, Cambridge.

## Married.

At All Souls' Church, Langham Place, on November 12th, the marriage took place of Lieutenant PHILIP J. LONG, R.F.C., son of Brig.-General A. Long, C.B., C.M.G., D.S.O., with ELEANOR, daughter of the late Mr. JOHN STUART BLACK, of Ditton Hill, Surrey, and of Mrs. Stuart Black.

On November 8th, 1917, at St. George's, Hanover Square, Lieutenant-Colonel C. T. MACLEAN, M.C., R.F.C., was married to MARIA DOROTHY, only child of Mrs. LEWIN, of Kirklevington Hall, Yorks.

The marriage took place on November 12th, at 2.30, at St. George's, Hanover Square, between Captain WILLIAM MORRICE, Yeomanry, attached R.F.C., and ROSE, widow of Lieutenant NORMAN CHAMPION DE CRESPIGNY, Queen's Bays, of Hanover Court, Hanover Square.

On November 7th, at St. Mary's, Bedfont, Lieutenant ARNOLD WEBB PHILLIPS, M.C., Royal Fusiliers and R.F.C., youngest son of Ex-Alderman Harry Phillips, was married to ELSIE MAUD, fourth daughter of Mr. and Mrs. J. W. COLES, of Clive Lodge, Bedfont, Middlesex.

On October 8th, 1917, at St. Thomas's Church, Fifth Avenue, New York, Captain HAROLD E. REYNELL, R.F.C., was married to GEORGIANA CATHERINE, eldest daughter of Mr. and Mrs. JOHN LIDDELL, of Shanghai, China.

## To be Married.

An engagement is announced between Captain A. DOUGLAS S. BARR, R.E. and R.F.C., elder son of Professor Archibald Barr, LL.D., and Mrs. Barr, of Westerton of Mugdock, Milngavie, and MAUDE CHARLOTTE, younger daughter of H. ARNOLD WILSON and Mrs. WILSON, of Craigmaddie, Milngavie.

A marriage has been arranged between Flight-Commander O. A. BUTCHER, D.S.C., R.N.A.S., and BEATRICE VIOLA HODGSON, younger daughter of the late Edmund Dorman Hodgson, of the Middle Temple, barrister-at-law, and Mrs. Dorman Hodgson, of 12, Montpelier Place, Brighton, and The Sycamores, Newick, Sussex.

The engagement is announced of Captain HENRY RICHARD KAVANAGH, Princess Victoria's (Royal Irish Fusiliers), attached R.F.C., only son of Hope Kavanagh, of Gorakpur, late Superintendent of Police, United Provinces, India, and SYLVIA, younger daughter of JAMES MARTIN, J.P., Surrey, of Bellair, Surbiton.

The engagement is announced of Lieutenant T. B. PRITCHARD, R.F.C., youngest son of Mr. M. J. Pritchard, of Kimberley, South Africa, and OLGA CECILE, only daughter of Professor ROLF HOK and Mrs. HOK, of 95, Cornwall Gardens, S.W.

## Items.

The will of Wing-Commander CLIVE MAITLAND WATERLOW, R.N.A.S., of Lessingham Hall, Lincoln, who was killed on July 20th in an aeroplane accident, only surviving son of Mr. David S. Waterlow, formerly M.P. for North Islington, has been proved at £6,849.

## THE AIR FORCE BILL DEBATE.

THE PARLIAMENTARY SECRETARY TO THE AIR BOARD (Major Baird), in moving "That the Bill be now read a second time," said:

It was intended that the Secretary of State for the Colonies should move the Second Reading of this Bill, but unfortunately he is indisposed and will be unable to come to the House for a couple of days, and I ask the indulgence of the House in the difficult task which has fallen to my lot. It may be desirable to sketch the progress of our organisation for dealing with aviation matters up to the present point. In 1912 the R.F.C. was formed, and provision was made for a Naval Wing and a Military Wing, to be maintained and administered by the Admiralty and the War Office respectively. The Central Flying School was also formed, and a reserve on as large a scale as possible. In order to secure co-operation between the two Services a joint Committee, called the Air Committee, was formed, composed of the Under-Secretary of State for War as President, the Commandant of the Central Flying School, the Officer Commanding the Naval Wing of the R.F.C., the Commandant of the Military Wing, the Director of Operations in the Admiralty War Staff, the Director of Military Training, and the Director of Fortifications and Works. It is not to be wondered at that this Committee proved to be somewhat unwieldy and the members tended to range themselves into two parties—a naval and a military party. The tendency was throughout to separate the Services more and more, and in 1914, before the outbreak of the war, the Naval Wing of the R.F.C. was changed into the R.N.A.S., and on the outbreak of hostilities the separation was practically complete. With the enormous extension which was rendered necessary by active operations in our Air Services competition was bound to take place, and it can hardly be denied that that competition was bad for both Services. The Joint Air Committee continued to exist but never sat, and eventually a Committee was appointed under Lord Derby to arbitrate between the claims of the two Services. The powers of that Committee proved inadequate, and its career was terminated by the resignation of its chairman. A few months later, in May, 1916, an Air Board was appointed under the presidency of Lord Curzon. It made an exhaustive and careful study of the situation, and made recommendations which resulted in another Board, with extended and increased powers and a different personnel, being appointed in December of last year. That Board, which is the existing Board, consists of a President, a Parliamentary Secretary, a representative of the Board of Admiralty, who is the Fifth Sea Lord, a representative of the Army Council, the Director-General of Military Aeronautics, and two representatives of the Ministry of Munitions. The outstanding feature of that development was the transfer of the Naval Air Service to the control of an officer raised to the rank of Sea Lord of the Admiralty—the Fifth Sea Lord—who was one of the earliest officers connected with aviation, and the first Commandant of the Central Flying School; and another important change was the transfer of the duty of supply to the Ministry of Munitions, the Air Board becoming responsible for the design of aircraft, engines, and accessories.

That state of affairs has continued up to the present date, and the whole tendency has been to amalgamate and centralise the different branches of aeronautics. The first thing that happened, which has been undoubtedly extremely useful, was that we all came and lived together, or as many of us as there was room for, under one roof in the Hotel Cecil, but the accommodation was quite inadequate. We are making efforts to extend, and undoubtedly the outstanding feature of this Board, which will cease to exist when this Bill passes and the Council is created, has been that by bringing the members of the two Services together under the same roof, together with the officials of the Ministry of Munitions who are responsible for supply, the officers and everyone concerned have got to know not only each other, but also the different methods of the Service, and it is necessary to put on record that nothing could be more satisfactory than the extremely harmonious relations which prevail between all branches of the Air Service at the Hotel Cecil. No one who knows anything about the situation questions that. Another satisfactory thing is the extremely valuable services rendered by the Ministry of Munitions. There was some nervousness at the start lest the transfer to a separate Ministry and a separate organisation of the duty of supplying highly technical things like aircraft and air engines might lead either to delays or to falling behind the times and failure to supply our flying men with the most up-to-date machines. That is always the great difficulty in connection with aeronautic supplies. If you could turn out to your satisfaction large quantities of machines such as are being used to-day there would be no difficulty whatever in the task, but the machines in use to-day will probably be obsolete, and certainly obsolescent, nine months hence, and preparations have to be made to-day for what we are going to have, as to quality and quantity, nine months hence. That makes supply an extremely difficult matter, and the closest possible co-operation between the designer, the user, and the manufacturer is absolutely essential in this branch of warfare. That we have secured to an astounding extent at the Hotel Cecil.

That is the good side. But looking at the problem of developing to the utmost extent our aeronautic resources with a view to hitting the enemy hardest from the air as often as we can and as much as we can, there is no doubt that the present system entails a great deal of divided responsibility. For instance, the R.F.C. is continually expanding. The Air Board has to supply all matériel, and the Army Council has to supply the personnel. The division of responsibility goes even further. In order to train pilots, for which the Army Council is responsible, the Air Board must supply training aeroplanes for which the Air Board is responsible. If there was a shortage of training aeroplanes, or engines, there would be a shortage of pilots. If there was a shortage of pilots all the efforts of the Air Board to provide more aeroplanes and engines would be wasted. In the same way, for training pilots new aerodromes are required. The Army Council has to provide them. If the Department of Fortifications and Works at the War Office should fail to supply the aerodromes the Military Aeronautical Director of the R.F.C. would fail to supply the pilots, and all the efforts of the Air Board would be wasted owing to the failure, which is quite outside their control or jurisdiction. That is only an instance of the difficulty and an example of the need for co-ordination in this matter. The duty of the Air Board is to co-ordinate the demands of the Navy and the Army, and, unfortunately, we have no staff to advise us on technical matters of that sort. That will be provided by this Bill. If there is disagreement under present circumstances between the Navy and the Army as to the allocation of aircraft the dissatisfied officer, be he the Fifth Sea Lord or the Director-General of Military Aeronautics, can appeal to the Army Council, but it says a good deal for the harmony which prevails at the Air Board that on no single occasion has either of these officers availed himself of that right.

There are other problems which require to be unified and dealt with as a whole. I might mention, for example, one which, I think, will interest Members and certainly will give no information to the enemy. One of the most important needs is a specialised medical service. It has been found by experience that flying men are subject to many peculiar physical disabilities, and research into the methods of prevention and cure of these disabilities has advanced very rapidly. So long, however, as the flying service remains merely as appendages of the Army and Navy, it is very difficult to provide for the study of these medical matters and for the special treatment of the patient. Knowledge on the subject is limited almost entirely to those few medical officers and civil practitioners who have had considerable numbers of flying men continuously under their care, and it is necessary at once to take special measures to provide

separate accommodation for the cases and separate staffs to concentrate on the problems which have arisen. The mere selection of candidates for the flying services has become a highly specialised business, and the standard of fitness required for flying is diverging from the standard required for the ordinary naval and military services. There are many minor physical imperfections which render a man unfit for flying, but which if taken in time might be removed or cured. Still more important, many precautions have to be taken to enable pilots who have obtained their certificates to maintain their fitness under the severe conditions of modern air warfare. These are only examples of the necessity for securing a body of men whose sole business shall be to concentrate on that particular branch of medical science which is necessary for the welfare and well-being of our flying men.

It might be asked whether this change might not have been brought about sooner. I think nobody who has really been in close contact with the flying services would agree that the change could have been brought about sooner. People are apt to forget what the strain is under which the officers and men are working, whose co-operation must be used in order to bring about this change. To change a service rendering highly specialised and vital service to the Army and the Navy such as the Flying Corps of both branches is doing at the present time, except by the advice of those who are really competent to judge, would in time of war be an extremely dangerous thing to do. Until you had an organisation bringing everybody together as we have now at the Hotel Cecil, I am perfectly certain it would have been quite impossible to have devised a satisfactory scheme without running very great risk of dislocation, which might have had disastrous effects in the field.

Mr. Lynch : Impossible for whom ?

Major Baird : I mean the people who are responsible for these things. I do not know that any civilian would have done it. I should have been very loath to have entrusted this work to any body of amateurs. These are the people who, after all, must have the guidance of the flying men. Those of us who have been concerned with the Flying Corps entirely endorse what the Chancellor of the Exchequer said on May 16th, when he was advocating the creation of the original Air Board. He said :

"Even if I believe an Air Minister was the right thing in the end—I think an Air Ministry may come out of it—I should say the right way to get it is to make some arrangement of this kind, to let it grow and gradually absorb more and more all the air services."

This view has been absolutely justified. Now I come to the Bill. We have endeavoured to draw a Bill which will create an air force and an authority responsible in air matters by using all the existing machinery so far as it affects our flying men to the utmost extent, with a view to the least possible dislocation and the smallest amount of innovation. The first Clause of the Bill is the usual form adopted on the creation of any new force. It was used when the Territorial and Reserve Force was created in 1907. That applies to Clause 2 except as regards pensions. Sub-section (1) of Clause 2 seeks to ensure that pensions which under various Acts go to soldiers will go to the airmen when they transfer from the Army and come under the Air Act. In the same way we have eliminated in Sub-section (2) the word "corps" and substituted the word "units," because it is not contemplated that airmen will be organised into corps. Disablement pensions are excepted because those pensions fall within the sphere of the Ministry of Pensions.

Mr. Billing : Can the hon. gentleman say what is the effect on a man who transfers from the Navy? Does he fall under the Army rule or under the Navy rule?

Major Baird : I am coming to that. It is set forth in the Bill. Clause 3 is the really important one, as it refers to the transfer of officers and men from the existing air services into the new force. There are two forms. An officer or a man can either be transferred, in which case he ceases to be a sailor or soldier and becomes a member of the air force, or he may be attached, in which case he is in the position of an officer or man seconded or lent by one service to another. He is very much in the position of officers of the Army who are seconded for service with the Egyptian Army. It has been thought necessary to secure that men who have engaged for a particular kind of service should not and cannot be forcibly transferred to another kind of service; therefore it is provided that the transfer can only take place in the first place with the consent of the officer or man, and in the second place with the consent of the Admiralty or the War Office as the case may be, and, obviously, with the consent and at the request of the Air Council. I think that is the gist of Clause 3. We are making provision for taking over the air forces of the Navy and of the Army subject to the consent of the Admiralty and the War Office, and subject to the consent of the officers and men whom it is proposed to take over. The transfer does not affect their term of service. If a man enlisted in the Army for seven years with the Colours and at the time of his transference had four years Army service he could only be kept in the Air Service three years. Sub-section (3) of Clause 3 equally safeguards the right to pay, pension, gratuities, retired and half-pay, decorations and rewards depending upon length of service which have been earned in the Service from which the man has been transferred. Equally, when an officer or man is attached to the Air Service, the fact that he is so attached shall not affect any right to any pay, pension, gratuity or so on which he has already earned, and he is precisely in the position that he would be if he joined the Egyptian Army or was seconded or lent for service in any other force. Sub-section (2) of Clause 3 provides :

"Regulations by the Air Council may provide that in the case of a person so transferred, the time during which he held a commission or served in the force from which he is transferred shall, for such purposes as may be prescribed, be aggregated with the time during which he holds a commission or serves in the Air Force; and that his entry into or enlistment in the force from which he is transferred shall, for such purposes as may be prescribed, be treated as enlistment into the Air Force."

The object of that is to enable officers to serve on courts-martial if they have sufficient Army or naval service to entitle them to do so, but would not have the necessary service if it counted from the date of their transfer.

Mr. Billing : Does seniority count in the corps service or only for the purpose of court-martial?

Major Baird : For such purpose as may be prescribed. It is put in with that definite object in view. There may be other reasons, but they are not at the present moment obvious. If the hon. member can think of any, perhaps we might put them in. I am explaining certain provisions in this measure. Clause 4 affects various rights and powers enjoyed by commissioned officers under different Acts of Parliament, and in addition to that certain privileges conferred by common law. They are all safeguarded, and the object is to put officers of the Air Force in precisely the same position as officers of the Army and Navy. Clause 5 deals with the application of the Military Service Acts, and is quite clear. Obviously, the Military Service Acts would not apply to the Air Force unless provision is made. The allocation of men as between the Army and the Air Force is a matter which must be settled by the War Cabinet, and the Ministry of National Service, in pursuance of the general instructions which will carry out the allocation. The present arrangement as between the Navy and the Army, under the Military Service Acts, is that information must be obtained from the men as to their preference for naval service, and the

Admiralty have first call upon the men who express that preference, in case their services are needed for that purpose. Clause 6 makes it possible to raise a Reserve and an Auxiliary Air Force. Obviously, in time of war, that would be inoperative, but it is necessary to provide in the Bill for time of peace. Clause 7 provides for any consequential Amendments of the Naval Discipline Acts and the Army Acts. Amendments are made in both Acts regulating the relations between the Air Force and the Navy and the Air Force and the Army respectively. There is one Amendment which does not fall within this category, and it is an Amendment of the Army Act, which will deprive the military authority of the power of requisitioning aircraft. It was not quite obvious to us what they would do with the aircraft, and it was not necessary to put that in. Clause 8 establishes the Air Council. The President of the Air Council is to be a Secretary of State, and a Secretary of State is, according to constitutional practice and precedent, created under the prerogative of the Sovereign. Therefore power is not taken in the Bill.

The other members of the Air Council will be fixed according to Order in Council very much on the lines of the Army Council, and the Order in Council will allocate their duties. We have not mentioned what is very important, but which it would not be proper to put into the Bill—*i.e.*, that the representative of the Ministry of Munitions will obviously continue to sit as a member of the Air Council, because there is no question of disturbing the admirable arrangement under which aircraft are now supplied by that Ministry. With regard to the other members of the Council they will be officers charged with duties analogous to those performed by members of the Army Council. The distribution of those duties will be made known and the composition of the Council will be laid down in the Order in Council.

Mr. Joynson-Hicks: May I ask if it is intended to provide that any member or members of the Air Council shall continue to sit one on the Army Council and one on the Board of Admiralty, to act as intermediaries?

Major Baird: There is no such intention, and for this reason: that when you create a separate Air Force the Army and the Navy will make their demands on the Air Council for their requirements, and the Air Council will then exercise the function now exercised by the Air Board and allocate to the Army and the Navy, not only aircraft, but the whole personnel, and will have to keep up the units and be responsible for them. There will be nothing, as far as we know, analogous to the present Department of Military Aeronautics. The Council will take over in the same way the powers of the Department of the Director of the Air Service. Therefore I think that the necessity for a member of the Army Council to be also a member of the Air Council does not arise. I do not know whether any special point arises on this Clause except the one to which my hon. friend has called attention. I may mention that Sub-section (4) refers to aerodromes and other property now vested in the Army Council or Board of Admiralty, and also to contracts for large works which are at present being carried out. Clauses 9 and 10 are common forms, and are taken direct from the Military Pensions Act of last year. Clause 11 enables the Fifth Secretary of State to sit in the House of Commons as well as his Under-Secretary and at the same time the provisions of the New Ministries Act are safeguarded.

Mr. P. A. Harris: Why is it necessary to create a new Secretary of State for Air and not for Munitions?

Major Baird: The head of the fighting service will have to discharge various duties now discharged by the Secretary for War, and which cannot be performed under our Constitution except by a Secretary of State. I will give one example. I believe the channel of communication between the Sovereign and an officer who feels himself aggrieved or the officer who has the right of reply is only through a Secretary of State. It would not be satisfactory if an officer of the Air Service felt aggrieved that he should have to apply to his Sovereign through the Secretary of State of another Department. Another reason is to give to the Air Force the same status as we give to the Army and Navy, to recognise that the air is an element in which it is as necessary to make provision for national defence and offence as it is for us to do on sea and land. These are the main reasons why it was thought wise to have a Secretary of State instead of a Minister of lesser rank. Clause 12 applies the Army Act, subject to certain modifications, to the Air Force. We were confronted, when we decided to have a separate Air Force, with having to choose between either the Navy Act or the Army Act, or creating some new Act for the purpose of enforcing discipline in the Force. After consideration, and on the advice of people well qualified to give it, we decided to adopt the Army Act, with such modifications as would make it applicable and suitable to the Air Service. These modifications are set out in the Schedule, and hon. members will find in the Vote Office the Act printed as a whole, that is to say, the Army Act, with the amendments introduced under this Clause, and in the Schedule underlined in that Act. Perhaps hon. members will allow me to run through the main changes to be made in the Army Act. They fall under the following heads: Those which are required to translate military terms into Air Force terms. These constitute the bulk. Those which create certain new offences, for example, causing the destruction or capture of aircraft or loss thereof, tampering with air signals, and so on. There is nothing analogous to that obviously in the Army Act. Then you will require to extend to the Air Force certain provisions in the Navy Regulations, due to uncertainty as to the nature and organisation of the Air Force. At the present time they are not sufficiently clear as to the duties to be discharged by certain officers. This is due to the comparatively small numbers of the Air Force. For instance, there is a reduction of the number of officers required to constitute a general court-martial from nine to seven, and authorising the sitting of military or naval officers on a court-martial where there is an insufficient number of Air Force officers available. There are also various miscellaneous Amendments, those introducing necessary definitions, and so on. These are the main modifications of the Act. The Act will automatically come into force annually with the passing of the Army Act. Provision is made in Sub-section (4) to ensure that the Act shall be kept up to date by making it necessary that Amendments to the Army Act, in so far as it is necessary to adapt the same to the Air Force, shall be introduced by Order in Council into the Air Force Act. The power is strictly limited by confining these Amendments to those which are definitely stated to be necessary for the Air Force. Clause 13 refers to a very large number of Acts relating to the Army which will have to be applied to the Air Force. They are over one hundred in number, and the most practical way to deal with them was to leave the matter to be dealt with by Order in Council. There are Acts relating to the acquisition of land, to military savings banks, to privileges and exemptions of soldiers, Acts relating to the property of soldiers, provisions as to wills, and so on. There are upwards of a hundred Acts in that category, and power is taken in Clause 13 to apply them by Order in Council to the Air Force.

I have explained very briefly the nature of the Schedule and I have endeavoured to explain the provisions of the Clauses of the Bill. I should like to make it clear that this Bill is not brought forward as a sign that the Royal Flying Corps or the Royal Naval Air Service is a failure. Anything but that. It is brought forward because it is felt that the moment has arrived when the existing organisation is incapable to discharge the duties which in the national interest it seems necessary should be discharged. In particular it is necessary to create an authority whose exclusive duty it shall be to study and deal with the general problem of war in the air. That authority will be exercised by the General Staff Branch of the Air Council. At the present time the study of these aerial war problems is confined to two separate watertight compartments, each of which is limited to the assistance which can be given by the Air Force to another arm—that means the assistance that can be given, on the one hand, to the Navy and, on the other hand, to the Army. But it is nobody's business under the

present organisation to think out air problems as a whole. In the second place it is necessary to provide a unified system for ensuring the most rapid, scientific, technical, and tactical progress in aeronautics. In the third place, it is desired to provide a unified system of administration to replace the present duplication of Staff and divergence of methods. These, briefly, are the reasons which have weighed with the Government in bringing forward this Bill. But, if the House will allow me, I would appeal to them most strongly to look upon this as a war measure in the first instance—that is to say, that the urgency of passing it is great. It is a measure which undoubtedly ought to supply an organisation that will largely increase the effectiveness of our national resources, and consequently help towards a peace which can only come after victory. But much more than that. It lays down the principle for all time that we recognise that we are no longer solely an island, and, so far as the air is concerned, we have to take measures for the protection of the realm and the maintenance of our rights in the air just as far-reaching and as permanent as we have to on the land or on the sea. More than that. I think anybody who has made a close study of this question will realise two things. In the first place, supremacy in the air is as essential to our national existence as supremacy at sea; and, in the second place, Providence has endowed Britons of all climes, be they born in Canada or Australia or in these Islands or in South Africa, with a special aptitude for airmanship which gives us a field for great work in the future.

Mr. Joynson-Hicks: I am not going to criticise now. The Bill is, in effect, a skeleton Bill. It is a Bill which must be clothed by Orders in Council. It depends entirely upon the manner in which this Bill is clothed, the flesh that is put upon the skeleton, and the spirit which is breathed into it, whether the Bill will really be a great success or not.

I am not going to criticise that. I realise that in time of war it is quite impossible to introduce a Bill creating in the fullest and most complete manner an Air Service which would be as great in its personnel as the Navy and as great in its importance as the Army. That would, indeed, need an enormous Bill, and I have considered carefully what course I ought to adopt in regard to the idea of proposing various Amendments. I think the better course, the proper course for one who is so keenly desirous of having an Air Ministry and a complete Air Service established, is to leave the Bill largely in its present form and not in any way attempt to amend it in the direction of making it a complete Bill. On the other hand, I think we are entitled—I am sure my hon. and gallant friend will not think I am in any way critical—to ask a few questions with regard to the Orders in Council, the course he proposes to adopt in those Orders in Council, and the time those Orders will be brought out. I see throughout the Bill that the consent of the Army Council and the Secretary of State for War, and of the Board of Admiralty, is from time to time required. In the second clause of the Bill no man or officer can be transferred to the Air Service without this consent. I am quite sure it is almost unnecessary to ask him to assure us that the consent has already been in effect granted to a complete transfer of the existing personnel of the Royal Flying Corps and Royal Naval Air Service to the new Air Force.

Major Baird: The Bill has been approved in principle by both Services.

Mr. Joynson-Hicks: That is not quite the point. I want to be quite clear that there is going to be no residuum left of the Royal Flying Corps under the control of the Army Council and no residuum of the Royal Naval Air Service under the control of the Board of Admiralty. I hope I may have an assurance from my hon. and gallant friend that so far as he knows it will be a complete and absolute transfer. I am going thankfully to welcome the Bill, however, now that it has come, and the new Imperial Air Service which is going to be, as we hope, a vast measure for winning this War. One point I would like to mention is whether it would not really be desirable, at all events in the first few years of the existence of this new force, that one member for the Air Council should have the right to attend and sit upon the Army Council, and that one member of the Air Council should have the right to attend and sit upon the Board of Admiralty.

There must be for certainly many months—probably a year or two—many questions arising between the three departments, and I would venture to ask my hon. and gallant friend to consider whether it would not be desirable that there should be some kind of liaison officer established between the old Services and the new Service. I take it, of course, that there will be the closest touch and co-operation between the new Air War Staff and the General Staff of the Army and the War Staff of the Navy. While I have pressed most strenuously for an independent strategic striking force in the air, I realise—and my hon. and gallant friend, perhaps, has not put this very clearly—that the greater portion of the Air Service must for some years to come be loaned partly to the Army and partly to the Navy. The great bulk of the R.F.C., after it has once been transferred to the new Air Service, will be loaned to the Army for use in the field, and I take it that the Air Council and the Secretary of State for the Air will, while that force is in the field under General Trenchard, or whoever may be the leading general, leave the disposition and discipline of that force to the commander in Flanders or elsewhere. That is an important point, and one which affects the position of men and officers transferred to the new Service, and who must be during the period of this War, as I take it, loaned to the Army in Flanders, in Mesopotamia, in Egypt or elsewhere.

I was very glad that my hon. and gallant friend placed the foundation of this Bill upon what can be the only real foundation, namely, that there is a new force fighting in a new dimension, and the time has come for those of the Army, and Navy, who have very gallantly co-operated with the air force in the last few years, to realise that there is a distinct difference between the air force and any other force connected with the Army or Navy. Only last week a high Staff officer from the Front complained to me, in discussing this Bill, that there should be created a new Air Ministry and Air Service. "Why," he said, "don't you create a new Ministry for tanks, or a new Ministry for Artillery?" Obviously, my gallant friend who made that remark was one of the old school of Army Officers, who think in one dimension only, and cannot get out of the idea that the aeroplane is only a kind of aerial motor car, and that everything that applies to artillery or motor cars which live in one dimension only must necessarily apply to the aeroplane, which lives and fights in an entirely different dimension. That is, I think, the real foundation principle upon which it is necessary to create this new Air Service. I take it that the Air Service will take command and control of all that is now done in the air by the Army and the Navy, and that there will be two separate forces under the general supreme control of the Air Board—one allocated to the Army and one allocated to the Navy, and under the jurisdiction of the respective Commanders-in-Chief of the Army and Navy. There is one point my hon. and gallant friend did not mention, and that is the defence of England against hostile aircraft, and whether it is proposed in any way to transfer this defence of England to the Air Board and to the Secretary of State for the Air, and in particular what is proposed to be done in regard to anti-aircraft artillery; whether it will remain under the Army or be turned over to the Air Board so as to make one complete controlling factor having control of everything to do with the defence of England against aircraft.

The last point I imagine will be dealt with by the new Board is the strategic offensive. My hon. and gallant friend knows that I have from time to time advocated a strategic offensive apart altogether from the Navy or the Army, and it is because of that that I have felt it was absolutely essential we should create a new air command, separate from the Army or Navy, with a fleet of machines of its own. The military view is necessarily confined to military matters. It is necessarily a short view. The military view takes notice only of the trenches and thirty or forty miles behind the trenches—the dumps and collecting ground of the rival forces—but we want this new Service to take

into the scope of its care a great strategical offensive far beyond what the existing Army forces are doing at the present time, or what the Army rightly do. I quite agree that the Army should have all the aeroplanes that it needs for its use in carrying out the work it is doing—for artillery observation and photography and short bombing raids close behind the lines, and so on. But I want to put it to my hon. and gallant friend as a soldier, and to carry all the soldiers in the House with me and the soldiers at the front too, in saying that the question of the strategic offensive is really a question of psychology and not a question of military expediency. There is where I think we have gone wrong up to the present moment. The question of whether it is worth while for Great Britain to institute such proceedings as have been instituted by Germany over the City of London is a question not for the Commander-in-Chief in Flanders, but for the War Cabinet here. It is a question not of whether we could exercise such military effect in Germany as could be exercised by dropping bombs on dumps or aerodromes behind the German lines, but whether we can affect the psychology of the German nation and affect their morale, for I am convinced that the result of this war will depend on the morale of the men in the trenches as it must be affected by the morale of the respective nations.

The point I want to press is that the new Air Service should consider, apart entirely from the views of the military authorities at the front, whether it is not desirable from the psychological point of view to get behind the enemy forces and smash, as I think we could do, the morale of the German nation and so produce a great effect upon the morale of the German troops in the trenches. I know that up to the present we have devoted ourselves to bombing dumps, but it seems to me it is better to bomb the place where the munitions are manufactured, than to bomb the completed article in the dumps behind the German lines. We feel that if it was good enough for the German High Command to spare machines in order to try to affect the morale of the people here—thank God they have not done it. I do not think they will succeed in doing it. I think that the morale of Great Britain is altogether different from the morale of the people of Germany; but, from my knowledge of German psychology, it would be worth while to transfer from the needs of the Army sufficient machines to try to affect their morale.

All this comes back to the question of production. The new Secretary of State with his Air Council must first, after he has got over the initial difficulties of instituting his new forces, devote himself, in conjunction with the Ministry of Munitions, to production. I have pleaded before this House, and I am going to plead very shortly again, for bigger machines and more high-power engines. The new force should not be content to get equal with the Germans, to make machines as good as the latest German machines, but should go boldly one better, jump over the heads of the Germans, and have machines bigger, faster and better than the German machines. Everybody knows that the Germans are devoting all their manufacturing efforts at the present time to the creation of a still larger air service for use against Great Britain and our forces both at the front and at home in the spring of next year. If we are to meet them, the only possible means of doing so is to create an equally large and equally strong Air Force. We know that the Germans are enlarging their plant for air purposes, that they have placed large numbers of orders in Switzerland for the production of air engines, that the Fokker Co. itself has taken over an enormous guano factory in Schwerin in order to manufacture aeroplanes, that they are building three-seater bombers carrying over a ton of bombing material, that they are now building two and three-engined machines provided with electric heaters, and that in the six months prior to August this year no fewer than 29 new aircraft factories have been opened by our German rivals.

I am not going to ask my hon. and gallant friend to tell us what we are doing. I merely want on this occasion of the starting of this new Imperial Air Service to press upon him that he must go to the Ministry of Munitions and ask them, if possible, to consider whether they can really divert some of the men and women who are now working at other forms of munitions to a great output of aeroplanes and aeroplane engines. I know that I have been regarded in the past as a fanatic on this point. Perhaps the Ministry of Munitions may say, "We cannot spare them from the creation of guns and shells." The rival armies have now had 3½ years' work with guns and shells, trying to beat one another up to the present moment it is fair to say that the war is not yet decided. Many of us who may be called fanatics have felt that there is a chance of the war being decided in the air. I for one say quite frankly that if the present Prime Minister, when he took in hand 2½ years ago the supply of munitions, when he put into that work that wonderful imagination and wonderful driving force of his, greater perhaps than that of any other man of the nation, had applied some portion of those qualities, while he was dealing with the production of shells and guns, to the production of aeroplanes and high-power engines, I for one feel that the war might have been ended in the air before the present moment. I feel most strongly that there is a very definite chance of the war being ended in the air next summer by whichever of these two great rival countries gets supremacy in the air.

One thing more: The work is only half done, but I believe that it will be completed by the spring or summer of next year, and I am convinced that when this new Air Service gets to work, when the new push, with the new drive that must come into it from whoever may constitute the new Air Council, coupled with the bravery which no words of mine or of anybody else in this House can paint too highly of the men in Flanders and our other fronts who are flying and fighting there, if next spring or summer means that victory which my hon. and gallant friend mentioned, the victory which will lead to peace, that victory will, I believe, be brought about in the air through the gallantry of those young men who have fought and are going to fight under this new scheme.

Lord Hugh Cecil: I am a strong supporter of the Bill. But, as my hon. Friend said just now, this Bill does not achieve, or anything like achieve, the object of building up an independent Air Force. He called it a skeleton Bill. It is, at any rate, only a beginning. It is inevitable that, in time of war, to set up a complete organisation by Act of Parliament, would be quite out of the question; but it is a desirable thing to do, because when first your Air Service is set up, it should be able to study all the problems involved. Let us pass the Bill as soon as we can and raise no points that are not really necessary to improve the Bill and make it more efficient than it is. If we display such a spirit, we shall not be unworthy of the gallantry of those who fight our battles and we shall in our humble capacity play our part.

Sir Henry Norman: I only desire to raise one point, and I do so particularly because it has been raised in a striking fashion by Mr. Joynson-Hicks. The point is this: My hon. Friend said that he hoped that there would not be left any residuum of the R.F.C. or the R.N.A.S., and that that was what the Bill did. The Bill in my understanding, and I raise this point to be corrected if I am wrong, does nothing of the kind. It is permissive. It may do it in the future, but the Bill, as it stands, may leave both the R.F.C. and the R.N.A.S. precisely as they are to-day. It might have the effect not only of creating a third Air Service, because at the end of Clause 8, Sub-section (4) it is stated,

"His Majesty may by Order in Council, transfer . . . such property, rights and liabilities of the Admiralty or Army Council or Secretary of State as may be agreed between the Air Council and the Admiralty or the Army Council, as the case may be."

Lord H. Cecil: I think my hon. Friend is mistaken; that Clause only refers to the property rights and liabilities; it does not refer to the Air Forces or personnel. Those are dealt with in Clause 13.

Sir H. Norman: Is not the personnel under precisely the same provision? The personnel may be taken over if the man is willing himself or if the Army Council or Admiralty consent. Is not that the case?

An Hon. Member: Yes.

Sir H. Norman: Then the personnel is on precisely or practically the same footing as the property rights and liabilities spoken of in Clause 8.

Mr. Billing: Perhaps the hon. and gallant Gentleman would clear up the point at once?

Major Baird: It is absolutely true. We are dealing with men in the Army and Navy, and we cannot, even by this Bill, take them without the consent of the Army and the Navy.

Lord H. Cecil: May I interrupt the hon. Gentleman? I do not gather from the Bill that there will be any air force except the one air force created when this Bill becomes law.

Sir H. Norman: I thank the hon. and gallant Gentleman opposite for his explanation. The matter seemed to me so clear that it hardly needed his confirmation. But the point raised by the Noble Lord—I put that because the suggestion is that there will be no Air Service except service in the R.F.C. or the R.N.A.S. It seems to me that under this Bill—and on Second Reading a Bill of so long a character is always, of course, a little vague—there may be a third Air Service formed under the new Secretary of State. Suppose that the R.F.C. on the one hand, when approached with a request, or an offer, from the new Secretary of State, says in correct, official, technical language that it does not agree, then, so far as they are concerned, is the thing to remain there? The same would be true of the Admiralty. That is in the Bill.

Major Baird: There is the War Cabinet. Undoubtedly, if the Army or the Admiralty refused to grant the airmen required by the Secretary of State, he will go to the War Cabinet, and, the War Cabinet having decided the matter, the Army or the Navy will have to give him what he asks for.

Sir H. Norman: I am very glad of that, because that clears away to a certain extent the only point I desired to raise.

Major Baird: It is a very important point. There may be certain officers, naval or military, who obviously are doing admirable service where they are as naval or military officers. We cannot—it would not be fair—arbitrarily take them away from the Army or the Navy if they are doing better service with the Army or the Navy. If, on the other hand, the Army or the Navy should in an obstructive way—and they have shown no signs of it—refuse to hand over large numbers of officers who are now training as airmen, the whole thing becomes confused. Then we shall go to the War Council, and place the matter before them.

Sir H. Norman: That, of course, as I say, makes clear to me the difficulty that I wished to solve, and answers the one point I desired to raise. We are then left with this situation: that this Bill may only create a third Air Service, leaving the R.F.C. and the R.N.A.S. as they are, except in a case of necessity where there will be the intervention of the War Cabinet. That states it accurately. The matter is really, as my hon. and gallant Friend said, one of very great importance, because most of us who are interested in the air look forward to the time, not far distant, when by the natural development of events, certainly not by any arbitrary action on the part of the coming Secretary of State, by the natural course of events and developments there would be, not a third Air Service but one great Air Service precisely as there have been one land service and one sea service. Many of us feel that if the War is going on for many months longer—counting it in months—it may be demonstrated, almost mathematically demonstrated, that the War can be won in the air. For that purpose it is necessary that there should be an absolutely uniform command and control in the air.

Mr. Billing: I should like to assure the hon. and gallant Gentleman who is piloting this Bill through that not only in the view of certain Members of this House, but certainly in the view of quite a number of Service Members, the Bill leaves very much to be desired. While I appreciate the fact that anyone who purposely obstructed this Bill would be doing his country and, as the Noble Lord opposite me particularly stated, the gallant men who are actually flying and fighting for this country, a great disservice, one would be doing them a far greater disservice by not seeing that the Bill when it passed met with their views and did them justice. Here, on this occasion, we are dealing with an Act which, instead of saying a thing "shall" be done constantly says things "may" be done. Posterity may well refer to this Act as the "May" Act. I only hope they will. Before we come to the Committee stage there are a number of points which I think need to be very satisfactorily cleared up.

The first instance we have in the title of the Bill itself. Here was an opportunity to embody in the Bill not only a grateful compliment to the Dominions, but even in the Preamble of the Bill there might have been a happier and more comprehensive title than the one we have. The Bill might have been called the "Imperial Air Forces Bill." On the other hand, it might have been called the "Imperial Air Service," because, if the hopes which have been expressed in the House this afternoon materialise I trust that the aeroplane, even as it is to-day, the most punitive weapon which has ever been placed in the hands of mankind, may eventually render war so terrible as to result in its abolition altogether. Under these circumstances the word "Force" would be an unhappy one. The word "Service" would be infinitely better. I sincerely trust, when this War is eventually brought to a close by the medium of and through the dominion of the air, that we shall discover a happier word than "Force" for referring to that Service. Imperial Air Service would have a more real meaning than Air Force.

I would suggest to this House that when the Air Service is in being directly the war ceases, if we are to keep the establishment which is absolutely necessary for us to be prepared for any eventuality or any invasion by air, some means will have to be found for employing aeroplanes on more productive work than mere flying from aerodrome to aerodrome to keep the skill of the pilot up to date and the machines themselves in flying order. I suggest that it will be found most probable that all the mails of this country, and possibly the mails of the Empire, will within the next few years be carried by the very service, to introduce which we are now debating the Second Reading of this Bill. So far as that is concerned, I would recommend with due humility to the Government, and with a proper appreciation of the source from which the recommendation comes, the suggestion that "Imperial Air Service," or, if the word "Imperial" is distasteful in the minds of the Government, "Air Service" rather than "Air Force" should be introduced as the name for that service.

The next point that arises is that, throughout the whole of this Bill, it seems to have been the determination of the gentlemen who framed it, under the direction, presumably, of the Officers of the Crown, to confer upon the War Cabinet or by Order in Council, whatever that may be, powers of dictatorship, and to remove from this House any opportunity whatsoever of controlling their future actions, their movements, or the destiny of the force which we now propose to create. Unless we are going to be handed over into a condition of bureaucracy, without any effort on our part, I would suggest that the Members of this House should watch this Bill, as an instance, very carefully, and not allow it to become a precedent of actions on behalf of the War Council, under the plea, which we hear so frequently at that box that it has almost lost its meaning, that all these things are necessary because we are in a state of war. I do trust that when we come to the Committee stage there

will be found Members of this House who are sufficiently interested in the privileges that a Member should respect to support Amendments on many Clauses which it is necessary to support if the House of Commons and Parliament are to retain the control of this Service. When the hon. Gentleman who is piloting this Bill referred to Clause 3, I noticed that he quite omitted, although I called his attention to the fact, the proviso of that Clause. Surely there is a proviso which is quite unnecessary. He states very loudly, with a considerable amount of satisfaction, that no man will be called into this Service against his will. He reads Clause 3, Sub-section (1), very carefully, that no man shall be called into this Service against his will and he utterly fails—I suggest almost to the point of deceiving the House—to read the proviso of that Clause which says that if that consent is not forthcoming from the man he shall be forcibly introduced into the Service. What is the next proviso? If, after three months, he has not become acclimated, he is to be allowed to go back to his original job. I call that playing with the matter.

Major Baird: I must settle that point. The hon. Member must realize that there are certain people at the present time who are prisoners of war and you cannot get at them, but if anybody within three months of receiving notice states he does not wish to be transferred, then the transfer is annulled.

Mr. Billing: I thank the hon. Gentleman very much, and I take it from his reply that this House can take it as sure and certain that provisos (a) and (b) of Clause 3 apply only to prisoners of war, and that no other member of His Majesty's Forces can be transferred to the Air Force against his own will. Is that so?

Major Baird: Nobody can be transferred to the Air Force against his will, prisoner of war or otherwise. This is to make it watertight.

Mr. Billing: I am very glad this point has been cleared up, because it was a point which operated on my mind to some extent. With regard to sub-section (2), the question of seniority, I should equally like the hon. Gentleman to clear up that point once and for all. He stated in his speech that the idea of allowing men to carry their seniority from the Army or Navy respectively, into this Air Force was purely for the purposes of court-martial. I do not know whether it would be more facile under Order in Council or the Defence of the Realm Act—which seems to cover everything for the support of the Government's policy—that for the purposes of the Air Force one day's service should rank for purposes of court-martial. If, on the other hand, it is not only for the purposes of court-martial that this seniority shall rank, I consider the Clause is most invidious and unfair. It puts power in the hands of a person or persons unknown, because I am sure hon. Members will appreciate that, so far as this Bill is concerned, the people to whom we are transferring this power are quite strangers to us. I have heard it suggested that Lord Northcliffe is to be Air Minister—he is a man of imagination and considerable force—and I have heard it suggested that the late Director of Military Aeronautics is to be the Minister. I have also heard it suggested that General Smuts is to adorn that post. At any rate, by this Clause it would be possible to transfer one man of five years' or three years' service and rank him of no years' service in the Air Force, and to transfer another man of perhaps one month's service in the R.N.A.S. and make him senior to the other.

If it is placed in the power of any Council to rob man of ten years' seniority without the right of a court-martial or appeal, you are not doing anything that will add to the harmony which is said to exist in such large quantities at the Hotel Cecil to-day. There are differences of opinion as to that harmony, but it is not part of my duty to refer to that now, and I am addressing myself purely and simply to the Bill. We have the question of pay and pensions. I am sure the hon. Gentleman will understand that questions of naval and military pay and allowances are important, and under these circumstances it would be interesting to have cleared up what acts on the decision of the Air Council in transferring naval or military men to the Air Service. If it is going to be a considerable decrease and they are going to suffer financially, it is reasonable to assume, in view of the ridiculously low pay compared with the cost of living, that by transfer they are going to suffer financial loss, you are not going to encourage the best men to come forward. I should like that point cleared up, and I wish the pay and allowances of the officers of this new Air Service could be embodied in the Bill.

Another point is that even now I utterly fail to see what the position of this new Air Service is to the Army and Navy, respectively. It is absolutely essential to the well-being of the Service that so far as possible the Naval Air Service should remain under the control of the Admiralty. I think it would be fatal to transfer the control or the policy of the Naval Air Service, so far as it is necessary to operate with the Grand Fleet, into the hands either of amateurs, as the hon. Member suggests, or into the hands of the Army officials, or anyone else. If the Grand Fleet by now does not know what it wants so far as the Air Service is concerned, it never will, and certainly it will not be taught by the War Office or the new Council. Just as the guns of battleships are under the supreme command of the officers in command of the ship, and the guns of an army are under the command of the army officers, so surely aeroplanes which are necessary for the operation of these respective services ought to be under those commands. That is no argument against a complete and entire Air Service operating in connection with both those Services.

It is not my intention to claim any special credit for the introduction of this Bill, but there is one thing which I have been pleading for the last nine years, and that is a separate Service. This Bill does not give the faintest hope that that thing is about to be accomplished. We want to know what the policy of the Air Council is going to be and what are its powers. How will it stand when it gets up against the Army Council or the Admiralty?

I would like it laid down in the Bill that the Air Minister shall not only have the right to request but to demand that every piece of material which is not absolutely essential to the well-being of the Grand Fleet and to the requirements of the Expeditionary Forces shall be immediately transferred to the complete and supreme control of the Air Council. I would like to see, instead of the new Ministry being dependent upon the good graces of the Ministry of Munitions, a certain proportion of the firms capable of increasing aeroplane output transferred to the Air Council. Is the R.F.C. still going to exist after this Bill has been passed into law? Are we simply going to bleed the R.F.C. of its best men, or are we going to take the sweepings of the R.F.C. to form the nucleus of the great Imperial Air Service? What is going to be the relationship between the Royal Air Service and the Admiralty? Are we going to have put into the Imperial Air Service all the direct entry men? Are the pukka men going to be allowed to transfer to this Service, or, if they volunteer, are they going to be allowed to transfer? As far as I can see, nothing can be done unless everybody agrees. Are we creating a real thing or are we simply creating a name—just a Ministry which is going to have the spare men of the two forces and any direct entries which they can get? If so, then the Service itself, quite apart from the Act upon which it is founded, is doomed to failure.

The Bill before us does not even say what the relationship of the R.N.A.S. to the R.F.C. is going to be. Above all, it does not say what the relationship of the Air Ministry to these four distinct and separate Services is going to be, beyond the fact that they should mutually agree what is the greatest good for themselves.

What members want to know, when this Bill is passed is, where the Services stands as a service. It is most essential that we should have an Air Service, and that it should be made worth a man's while to join it and that he should be able to take up flying, the same as a man can take up the Army or the Navy, as a career.

Then there is the question of the Aircraft Factory. Where does that stand? Is it to be handed over to the Royal Air Service or is it going to be retained

by the Flying Corps. There is nothing in the Bill. That is a most important thing. It has never been my job in this House to plead the cause of a trade, but there is a very important work going on at this moment which has a very great bearing on the whole future of aviation in this country. The Government is putting up huge factories all over this country which are nothing more nor less than Government factories. They are putting up all the money to build them and are supplying all the material for the purpose of building the aeroplanes, they are paying all the wages bills, and putting fictitious names over the doors to make people believe that they are private enterprises. I can give the names of four of them in private who have no more financial control than the office boys. They simply draw a small commission on the machines that come out. Their names are used as a blind to deceive the trade. It may be in the interests of this country to set up these vast factories and to produce under these conditions, but if you stifle enterprise and arrest its development you will find that other countries, which have not arrested private effort, and have not endeavoured to stamp out individual ingenuity, will leave us trailing behind in the fight for the supremacy of the air.

So far as transport works and buildings are concerned, the R.N.A.S. have decorated the coast of these Islands at intervals of about two miles with vast buildings that contain, among other things, some thousands of engines which, unfortunately, are obsolete or obsolescent, and a considerable number of very excellent seaplanes and flying boats. What is going to happen to all these? Are they to be handed over to this new Service? Surely these are matters of very grave importance, and the Bill ought to inform the House what is to happen in regard to them.

The Bill does not provide the name or the rank that the various officers in this Service should carry. It does not provide whether this Service is to have a distinctive uniform. Hon. members may think that is a matter of small importance, but I can assure them it is nothing of the kind. The question of uniform has caused considerable friction. The question now is to whether this Air Service shall be given distinctive uniform is one of very considerable moment to the men who will come forward to join the new Service. Then we come to the question of title. You have lieutenants Royal Navy who rank with the senior two captains in the Army, and you have hundreds of lieutenants R.N.V.R. who presumably take the same rank with officers in the Army. Are you going to transfer these men piecemeal into the new Service? Captains are going to come in and find themselves junior to naval lieutenants and naval lieutenants are going to find themselves junior to military men. What are you going to call these men? Might I suggest to the Minister that the best thing would be not to transfer any of these men, but to allow them to come out of the Service for 24 hours and to be civilians again. There would then be no question of transferring them with their rank or seniority. Let us start on a clear basis. Let us start from zero and give to these men the appointment which their ability justifies, irrespective of the position they have occupied in the past. You will find many young lieutenants who are infinitely more fitted to lead squadrons than many transferred squadron commanders in both Services. I should like to see all these young fellows brought out.

I should like to see a council or selecting body established and each man bringing his dossier showing what he has done, where he started, and what his experience has been. Then let him be offered a post in the new Service which he deserves, irrespective of his previous seniority.

If this Bill passes as it is to-day it is neither a credit to its critics nor to its constructors. It is a nebulous and useless Bill and the only thing it does is to rob the House of Commons and private members of the House of Commons of the privilege which freely elected men, when you can find them, really should have.

General Sir Ivor Philipps: I want to ask one question on a subject treated earlier in the Debate. When the hon. and gallant Gentleman who moved the Second Reading was asked whether it was the intention of the Government that the R.F.C. and the R.N.A.S. should be handed to the Air Council, he replied, "Yes, as far as I know." That is, of course, not a very definite statement from the Minister in charge of the Bill. I think the House is entitled to rather more information as to the Government's intentions. I do not ask my hon. and gallant Friend to lay down definitely what the Government are going to do. It would be absurd to ask that, but I do suggest he ought to give us something better than "as far as I know." When an hon. Gentleman sitting on the Opposition Bench asked later on what really was going to happen, the hon. and gallant Gentleman said that if the Army Council and the Admiralty did not come to an arrangement about handing over the Forces to the Air Council then, of course, the War Cabinet would intervene and give definite orders which the Admiralty and the Army Council would have to carry out. That is quite a reasonable proposition. But then we have this remarkable Clause 3, which I want to bring to the attention of the House. You are setting up an Air Force in time of war. One would imagine that at once you would transfer every flying officer and man to the new force. But you do not do it. The hon. and gallant Gentleman in charge of the Bill said: "We do not want to compel anybody. We do not want to compel a seaman in the Navy, although he may now be in the Flying Corps, to go into the new force. Neither do we want to compel a soldier who may now be in the Air Service to go into the new force. We will not use compulsion." We know we are at war. The Front Bench are always telling us that. You take a man from the plough and you send him into the trenches, or you take him from an office and send him there. But you may not take a flying man who is already in the Service and transfer him from the Army or Navy into the Air Force.

I do not think for one moment we are going to have a single Air Force as the result of this Bill. There is nothing in the Bill which prevents the Army and the Navy still keeping up their Air Force, and I have not the slightest doubt in my own mind that the matter has been left in that nebulous condition because the Army and Navy have definitely determined that they will have their own flying forces. I do not believe for a moment that the Army could surrender its flying force. You have only to be in the front line of the Army in France to realize the intimate connection there is between the Artillery and the aeroplanes, and it is almost incredible that they are to be entirely divorced. At the present moment you have the Navy and the Army Flying Services more or less connected under the Air Board. Directly this Bill becomes law the new Air Force has no control over the Army or Navy Flying Services, and, consequently, all the good that the present Air Board has done will be entirely vitiated. You have actually a Secretary of State for the Air who has nothing whatever to do in any way whatsoever, by law, with either the work of the Army Council or of the Admiralty.

Mr. Lynch: It seems to me that in introducing a Bill of this kind which is the foundation of an entirely new arm of defence, one might have proceeded from the great exterior situation, observing the necessities of the situation which have been imposed upon us by the Germans themselves, and regarding the problem in that way step by step to work down until the final basis of construction was reached, so that from that point the plans could be built up step by step, which would finally give us an adequate reply to the German menace. But instead of the Bill being conceived in that form as a reply to the German menace, it seems rather to be conceived as a measure for amelioration, improving and developing the present bad system.

Mr. Hohler: I regard this Bill as one of great importance, but its terms are to my mind exceedingly nebulous. The real difficulty, as I have always understood, is the competition between the R.N.A.S. and the R.F.C. I doubt whether this Bill solves those difficulties. The great difficulty is in regard to the manufacture of the very best aeroplanes to be supplied for the Air Services, for which

both the Admiralty and the Army, as I understood, were competing. I see nothing in this Bill to get rid of that. It does not in any way indicate what powers the Admiralty will have and what powers the Army will have in regard to the disposal of Air forces. The conditions in regard to sea and land are wholly different, but it is clear that the Army must control on land and the Navy on sea. There is nothing in the Bill to suggest that course should be adopted. On the contrary, I am surprised that the Bill contains a provision that any officer or man in the R.N.A.S. or the R.F.C. may within three months have to be remitted to his own particular service. That does not to my mind speak of co-ordination or co-operation.

The Attorney-General (Sir F. Smith): The only object with which I have risen is to attempt to reply to one or two points which have been raised, and I hope I will not be considered punctilious when I say that those who have addressed to us a large number of questions left the House on the conclusion of their speeches. I am not desiring to take advantage of any such technical point, and I will attempt to address myself to the more serious points that have been raised. I hope I shall be permitted to begin by saying that no one is entitled to think that the bringing in of this Bill is any admission that the growth, increase, and efficiency of the Air Service, both naval and military, in the course of this War is not one of the most marvellous improvisations that this War, or any other war, has ever witnessed. It has been said by some of the critics of the Government that we ought to have introduced a proposal of this kind earlier. Others of our critics have said that we ought not to have introduced them at all. These lines of criticism were perhaps a little mutually contradictory, but I think the House will be willing to bear in mind, in justice to the officials concerned, and in justice to those politicians who are responsible and who are over the officials, that they found themselves compelled, in time of improvisation, to multiply all our resources in the air, whether in the Navy or in the Army, when the very existence of the Army and of the Navy may depend at any moment on the rapidity and success with which that improvisation is carried on. Those who do justice to those considerations will, I think, be a little slow to criticise severely those who have been thought slow to introduce amalgamation of all the Services, which, everyone knows, was greatly resented by many members of both those Services. Let us never forget this, that the moment you develop a naval Air Service, and side by side with that you develop a military Air Service, you have immediately the soil from which competitive instincts spring, and this nation would not be the nation it was if from that soil and from those origins, from the very circumstances of the co-existence of naval and military flying, we had not that competitive instinct which in the past has been the soil, the fruitful soil of gallant deeds.

Mr. Billing: Why not have two Navies and let them compete?

Sir F. Smith: That question is even more foolish than those which the hon. gentleman addressed to my hon. and gallant friend. The hon. gentleman says why do you not have two Navies to compete. If the hon. gentleman could keep sufficient control of his listening faculties to understand even the most elementary points that were being made in debate he would see—

Mr. Billing: You have not made one yet.

Sir F. Smith: He would see that I was not recommending the existence of that competition as an advantage, but that I was rather founding the case from this Bill, which attempts to abolish it, and I was trying to explain what had been the difficulties in the way of those who, before to-night, had to deal with the task of amalgamating the improvisations.

Mr. Billing: You were recommending competition for efficiency.

Sir F. Smith: The House listened to a long, rambling, irrelevant speech by the hon. gentleman, who took an hour. I have not the time to answer the foolish questions he addressed to the House. I was attempting to explain the reasons why this change had been so slow in adoption. I think the House accepts from me the suggestion that once you started, as we were bound to start, under the historical circumstances in which the Air Services started, on a competitive basis, it was inevitable that you would create vested interests. You created vested interests in this sense, that every man in the Navy and in the Army—and, indeed, it is human nature, and it is known to be human nature—who has a command is naturally concerned to magnify the importance of that command and, if it be possible, to extend it. What has happened—the most wasteful and prodigal competition between the two Services. It is not convenient in every case to give full examples or explanations, but there are very few people concerned and who study these things who do not know the immense injury that is occasioned to the Services by overlapping and competition between them. It might well be if we had been all-wise, and if we had ample leisure and no other problems jostling against one another for consideration by His Majesty's Government, that we should have been able to deal with these things at an earlier stage of the war. Let it not be forgotten that in war the Services are all-powerful. The House knows well enough what happens on the slightest attempt on the part of politicians to interfere with soldiers or with sailors. I have always been of the belief that it is one of the greatest misfortunes to attempt to foster, as has been done in the Press, the idea and to represent that the soldiers and sailors were all in one camp and that all the politicians were in the other camp. My reading of history teaches me that no great nation has ever emerged from a great struggle that decided its very existence, and may determine its very future, unless the politicians were able to work side by side and hand in hand with the sailors and soldiers. They do an ill service to their country who attempt to disestablish that simple cacophony between the politicians and the Services. It is true that when the soldier or the sailor have come to manage on existing lines a particular arm of either Service that it is extremely difficult for the politician or the statesman to interfere.

But I do say this, the patience of successive Governments has induced them to try and overcome by persuasion the detailed arguments of the Army and the Navy to similar proposals to those of this Bill, which are the surest guarantee that the great new proposals—for they are great proposals!—shadowed in this Bill will be worked with a minimum of friction and a maximum of good will between both of the Services. It is true that considerable sacrifices are to be asked from both of the great Services under the terms of this Bill. The hon. gentleman who addressed the House in a very moderate and a not unfriendly speech asked several questions upon this point. As I understood him, he inquired whether the new Air Board, to be set up, would absorb the functions at present discharged by what I may call, in popular language, the Military and Naval Wings. The main fundamental object of this Bill is to recognise what is the most amazing fact in modern warfare—that is, that all the conditions of warfare have been revolutionised by the calling into existence of a new arm, the consequence of whose intervention are so immense and so incalculable that no one who is at all cognisant of the operations of this war can doubt that for good or for bad and for all times a new arm has declared itself in war which is distinguishable from the regular arm as was the Navy from the Army in the old days. It is the recognition of this fact that is the motive and spirit of this Bill. How far it has been carried out precisely is a matter, as I think my hon. friend will see, very difficult of definition. It is not so difficult to understand as difficult of definition. What, however, is important is the spirit with which this Bill is conceived and the spirit with which it is contemplated that the Orders in Council shall be framed. It is the spirit and object of this Bill that the Air Service shall be recognised as an entirely distinguishable Service, that those who are responsible for it shall form a new and important Department answerable to Parliament and responsible for the Service for which it so answers to Parliament, and with complete control unfeathered by any other Service over all those who belong to it. My hon. friend may say: Surely some qualification is necessary to the very nature of the case in that Department?

The real point of the qualification is this: It is quite obvious that the great usefulness of the Air Service which is attached to an army is that it may be the eyes of the army. In other words, so long as it is loaned by the Air Board, say, to Sir Douglas Haig, it is quite obvious, if you have overlapping and if the Air Council were to interfere with that object it would be destruction of military efficiency. But, subject to that qualification, the Air Council is to be supreme. The qualification is not one with which, I think, any member of this House is likely to quarrel. The same qualification is necessary where units are lent to the Navy. As to the questions of promotion, those are matters which require the most careful consideration. Similar problems have arisen in connection with the employment of the Naval Division under the Army, and problems which, though not identical are analogous, have arisen in the case of the Colonial troops. The precise methods are a matter which can either be raised in Committee or which can be discussed with reference to the Orders in Council.

Sir H. Norman: Is it not the case that under the Bill the Orders in Council of which the right hon. and learned gentleman speaks, which would refer to the R.F.C. or the R.N.A.S., would be quite ineffective without the consent of those Services?

Sir F. Smith: I really think, if my hon. friend will allow me to say so, that when he makes that observation he has not sufficiently reflected upon the conditions under which Government is carried on under modern conditions. Let me explain what I mean. It is quite obvious that you may have, if good will is not forthcoming, a hundred points of friction. You may have friction between the Admiralty authorities, the Army authorities, and the new Air authorities. I assure my hon. friend that we have such differences of opinion almost every day or every week in this Government, and the method in which those are resolved is that where there are competing claims the representatives of the Departments in which those claims compete go before the War Cabinet, and they state their case, and the War Cabinet arrive at a decision. Do not let me embark upon the great topic whether that is the best method of Government in normal times, but I do say confidently that it is the only way in which in the Cabinet you could deal with matters of that sort.

Sir H. Norman: The War Cabinet, and not the Orders in Council.

Sir F. Smith: The hon. gentleman does not suppose that Orders in Council are passed without consideration and discussion between the Departments concerned. They do not spring up like mushrooms by night. They are discussed between Departments concerned, and if there is controversy between them they must go to the War Cabinet, and then a decision is reached at the War Cabinet. Take the simplest illustration of all. Sometimes there is a question as to the appropriation of personnel, and a question is raised as between the Army, Navy, and Air Service whether certain men ought to be drafted into the Air Service, or some question is raised as to the promotion of officers. All those matters have to be dealt with by Order in Council. The hon. gentleman the member for Herts (Mr. Billing)—although I exchanged a somewhat unfriendly passage with him a moment ago, I have, I assure him, not the slightest unfriendliness towards him, and, I notice, as other hon. members notice, the constant zeal which he devotes to this subject—but I think he was profoundly mistaken in the whole attitude with which he approached this Bill. He stated in the course of his speech an innumerable number of supposed omissions in this Bill. His knowledge of such points enables him no doubt to specify—and I do not doubt to specify with accuracy—a large number of points upon which this Bill is silent. I would only ask the House to consider what would have been the dimensions of this Bill supposing we had attempted to include in it every point of omission referred to by the hon. gentleman in his speech. Long as this war may prove to be, this Bill would hardly have passed Parliament, even on the most pessimistic basis. If it, indeed, be true that you cannot rely on the Army and Navy now in the fourth year of war, loyalty and patriotism to combine to create a great Air Service, if, on the other hand, you cannot rely on them to give the political authorities the advice which they alone can give, so that wise and prudent Orders in Council can be formulated dealing with all the points that he suggests ought to be put in the Bill, if you cannot rely on the naval and military experts to do that, I, for one, would despair of ever creating a flying service, in spite of the lessons this war has taught.

Mr. Hohler: It seems to me very important that it should be explained to the members of the R.N.A.S. and the R.F.C. the position they will hold after the war. What is to happen to them then? I do not want to impede this Bill, but I should like to be assured that these airmen are not to suffer under this Bill.

Sir F. Smith: I do not think their position is altered at all. Either they engage for the period of the war or they are attached. But is not this question a little out of the perspective with the crisis of the Motion? Surely the House of Commons may be trusted on the conclusion of the war to see that the officers who have left the Army or the Navy to go into the Flying Service—not less dangerous than the most dangerous positions in the Army or Navy—sustain no loss. I think my hon. friend will find that the most studious care has been taken to avoid any such consequences, but if he will, in Committee, point to any hiatus in that respect he will find that it will receive the most careful and sympathetic attention of the Government. The member for Southampton (Sir Ivor Philipps) asked a question very forcibly, and it certainly deserves and requires an answer. He said that you are taking men from the counter and the shop and putting them into the trenches and other places equally disagreeable, and I cannot understand why you deny to yourself, except with the consent of the persons affected, a power to move them from one branch of the Army or Navy into the Flying Service. That is a question to be answered in Committee. Whether it be right or wrong, it is the reason which influenced the Government, on the advice of the military and naval experts, to come to this conclusion. There is an old tradition in the Army, and I believe in the Navy, that if a man joins the Guards or the gunners he has made his choice, he is entitled to it. He has selected his own field of gallantry, and we ought not to remove him except with his own free consent.

Sir Ivor Philipps: We have often in this House ignored that rule entirely. We have taken men not only from one branch of the Army to another branch, but even from civil life. What I suggested was that as long as this Clause remains as it is now it does make those who like myself are anxious to see an efficient Air Service doubt whether there is any stability in this Bill because only a few men come forward voluntarily and you leave it to the individual.

Sir F. Smith: My hon. friend is very familiar with military duties, and he will understand why this was inserted in the Bill. He is fully entitled to point out that great changes in tactics have taken place, and to raise this question on the Committee stage when the Government will be fully prepared to consider his suggestion. I have attempted as far as I can to deal with the various points that have been raised. The Government recognise the friendly spirit with which the House as a whole has been good enough to receive this Bill. They have received it in the spirit of a war Bill—not perhaps perfect in every detail—incapable in the circumstances of the time of containing all the terms upon which the House would insist in normal times of peace. If the Government receive, as we anticipate that we shall receive, the same indulgence from the House in the later stages of the Bill, the House on its part will find that the Government are prepared and anxious to consider in sympathetic spirit every criticism and suggestion that is made, and is obviously made with the object of improving the Bill and rendering it more workable.

Question put, and agreed to.

Bill read a second time, and committed to a Committee of the Whole House for Wednesday next.

## QUESTIONS IN PARLIAMENT.

### Royal Flying Corps.

COMMANDER WEDGWOOD, in the House of Commons on November 6th, asked the Under-Secretary of State for War whether any steps can be taken to increase the recruiting of officers for the Royal Flying Corps from public school boys reaching military age, as, for example, by arranging for successful squadron commanders to lecture at the schools and by increasing the rewards for individual courage in the air?

Mr. Macpherson: I understand that there is no shortage of candidates as pilots. The requirements of the Army have to be considered as a whole, and in this particular sphere of recruiting, which provides highly desirable recruits for all branches of the Army, I do not think any particular arm of the Service should have preference.

### Royal Naval Air Service.

MR. T. WILSON asked the Secretary to the Admiralty if he is aware that men who have joined the R.N.A.S. who have passed the trade test and who were skilled woodworkers when they joined are having their rating reduced, some of them after having been in the service ten or twelve months; that when they protest against the derating they are told they will be discharged and then forced into the Army; and whether he will enquire into this matter with the object of preventing such treatment of these men?

Dr. Macnamara: Except on disciplinary grounds, men are only disgraced after entry when they have been reported by their commanding officers as being incompetent to perform the duties of their rating, and in such cases they are invariably given another trade test before disgracing. If they refuse to accept the rating for which experience has shown they are fitted, they are discharged from the naval service. After discharge from the R.N.A.S., they have the same rights and privileges and are under the same obligations as any other civilians. I may say that discharges for incompetence in the R.N.A.S. are comparatively rare.

### Enemy Air Raids. London Defences.

MR. LYNCH, on November 7th, asked (1) whether a range-finder for aircraft is still in use in London's defences; if so, whether the type originally adopted has ever been altered; whether the guns fire according to the indications of the range-finder or at random; (2) whether the time-fuses for anti-aircraft guns are fixed to correspond to a certain height and the gunners are instructed not to alter them, though the height to which the aircraft ascend may vary and become much greater than that for which the first adjustment was calculated?

Mr. Macpherson: It is not in the public interest to disclose the details for which the hon. member asks.

Mr. Lynch: May I ask if the War Office will imprint upon their portals this aphorism from Carlyle?

"With stupidity and sound digestion, a man may front much."

### Air Board (Offices).

MR. WATT asked the First Commissioner of Works whether it is proposed to commandeer the offices of the Metropolitan Board of Works for the use of the Air Board; will he say how many rooms and how many employees have the Air Board at present in the Hotel Cecil; whether premises other than the Board of Works can be got in Government or Council's property; and whether

he will give assurances to hotel users and hotel proprietors that no more hotels in the Westminster area will be requisitioned for Government work?

The First Commissioner of Works (Sir A. Mond): The acquisition of the offices of the Metropolitan Water Board, to which it is assumed the hon. member's question refers, is under consideration by the Cabinet Committee on Accommodation. The number of rooms occupied by the Air Board in the Hotel Cecil is 595; for information as to the number of staff employed there my hon. friend should address a question to the Parliamentary Secretary to the Air Board. No suitable premises are available which are the property of the Government or the London County Council. I can give no definite assurance that no more hotels in the Westminster area will be requisitioned for Government work; it is impossible to foresee what demands for accommodation may be made by War Departments.

### Brighton Shoreham Aerodrome.

COLONEL CAMPION asked the Under-Secretary of State for War whether the umpire appointed to assess the compensation payable by the Government in respect of the acquisition of the Brighton Shoreham Aerodrome has yet made his award; if so, what was the amount awarded; and what was the amount claimed by the owners?

Mr. Macpherson: An award has been made by Mr. Edwin Fox, the umpire appointed to assess the compensation payable by the Government to the Brighton Shoreham Aerodrome, Ltd. The sum of £25,765 was awarded as against a total claim of £191,000.

### Sir John Simon.

MR. HOGGE, on November 8th, asked the Prime Minister what post the hon. member for Walthamstow has been given in the Army; whether he can state the rank given to him; and whether he can explain how this is possible in some cases and not in all?

Mr. Macpherson: My right hon. and gallant friend holds the appointment of a staff captain in the R.F.C., with the temporary rank of major. Rank is given where it is necessary to enable an officer to carry out his duties properly.

Major Hunt: Has the right hon. gentleman the member for Walthamstow ever before been in the Army service?

Mr. Macpherson: I do not know whether my right hon. and gallant friend the member for Walthamstow has ever been in Army service before, but I think the Army would be ill-advised to refuse the services and conspicuous ability of a member of this House who is prepared to offer them in a spirit of self-denial and in a self-sacrificing manner.

Mr. Hogg: Can my hon. friend say what are the duties of the right hon. and learned gentleman in this particular rank?

Mr. Macpherson: I do not know exactly, but my hon. friend will understand from my answer—and I hope the House will also understand—that the right hon. gentleman the member for Walthamstow is not attached to the staff in any fighting capacity, but attached to the staff in a way that his conspicuous ability will be of enormous value to the State.

Commander Wedgwood: Is it not the fact that the right hon. gentleman, in taking up this post in France, is sacrificing £25,000 a year?

Mr. Macpherson: That is absolutely true, and the other fact which should be remembered is that my right hon. and gallant friend is over military age.



A seaplane, in what was German East Africa, about to start a flight over the German cruiser "Konigsberg," for the purpose of "spotting" for artillery work.

## ANSWERS TO CORRESPONDENTS.



[As a number of letters reach us signed with initials only, some of which do not give a complete address, we would point out that such communications cannot be dealt with in our columns. Full name and address, which will not be published, must always be given.—ED.]

**H. H.** (Shepperton).—You are quite right in assuming that an aeroplane whose speed in still air is 120 m.p.h., would be flying at a speed relatively to the ground, of 140 m.p.h.—if it were flying with a following wind of 20 m.p.h.

**E. M.** (2nd Lieut., R.F.C.).—We regret that we have not been able to identify the machine shown in the sketch you send us. If the sketch is drawn from another drawing we incline to think that the machine is an imaginary one. If, however, it is drawn from a photograph the machine is not familiar to us.

**Young Pilot** (Lincs.).—We are not sure that you are correct in saying that "such a lot of guns seem to jamb at the critical moment," but with the delicate mechanism of a machine gun it is only to be expected that occasionally one will be found to do so. The reasons may be various, and to trace them is rather outside the scope of these columns, especially as we are not at present in a position to freely discuss the merits or otherwise of the armament of aeroplanes. During an air fight things happen pretty quickly, and the changing of a drum often has to be done with the utmost quickness, hence it is conceivable that there may be cases of jambing due to a hasty change of drums before the favourable position has been lost. (b) We do not think that this is the cause of the trouble in most cases. (c) Yes.

**T. H. J.** (Chingford).—The idea of placing the petrol tank in the rear of the *fuselage* in order to reduce the risk of it catching fire is not, we are afraid, a feasible one. Although as you point out, the extra weight could be carried by making the tail plane larger, the increase in size would be such as to make the machine for practical purposes a tandem, and this placing has been found to give very poor efficiency. It should be remembered that the weight of tanks and petrol for, say, three hours' flight, might easily amount to several hundred pounds, and this weight, even granting that it could be carried by the tail plane, would greatly increase the moment of inertia of the machine and render it difficult to control, not only as regards the elevators but also with reference to the rudder. Everything considered, we cannot advise you to go on with the idea.

**T. M.** (Coventry).—Judging from your description, the first mentioned machine is a B.E. 2E., and the second an R.E. 7.

**A. G. P.** (Streatham).—So far as we know, there is no publication dealing exclusively with the R.A.F. products. Illustrations of the later types are not available, as publication of the latest British machines is not permitted during the war.

**E. J. S.** (Ealing).—To be quite frank with you, we do not

think that your sketch would be quite good enough for an advertisement drawing, seeing the high standard demanded for this class of work. With regard to the engines fitted in the machines you mention, we are not permitted to give any information on the subject. We are not aware that the objections to the machines mentioned in your letter exist. With regard to the last, the appearance surely is a matter of personal opinion, and we can assure you that this particular machine is still used very extensively indeed, and will probably continue to be used for a long time to come.

**A. J. D.** (Scilly Isles).—The lifting power of hydrogen will vary according to the quality, and also according to atmospheric conditions. A fair average figure would probably be 68 to 70 lb. per 1,000 cu. ft. of hydrogen. A balloon, to be able to lift 6 lbs. in addition to its own rigging, would probably have to be about 7 ft. diameter. You would find the book by R. P. Hearne, entitled "Zeppelins and Super-Zeppelins," useful. A copy can be obtained from the offices of "FLIGHT." The price is 2s 10d. post free.

**G. J. E. C.** (Holt).—The hole in the top of a parachute allows a certain amount of air to escape, thus steadyng the descent of the parachute. If the hole was not placed there the air would have to escape under the edges of the parachute and would start it swinging from side to side, which might end in a catastrophe. The letters SPAD stand for *Société pour Aviation et ses Dérivées*. We are not permitted to give any particulars of the machine you mention. "War Flying," a copy of which can be obtained from the offices of "FLIGHT," the price being 1s. 2d., post free, will be found very interesting. Details of the latest types of aeroplanes cannot be published during the war.

**F. G.** (Betchworth).—We do not think you will be able to obtain anywhere plans for a model of the machines you mention, but scale drawings of the actual machines have appeared in "FLIGHT," and from these you may be able to build a model. The Morane monoplane was illustrated in our issue of May 24th, 1913, and the Bristol scout in the issue of April 25th, 1914.

**C. E. H.** (Harlesden).—We are not permitted to give any particulars of the latest aero engines.

**E. H.** (Birmingham).—We do not know why the machine in question has been given this nickname, certainly it is not meant in any sense to "run down" the machine, which is, as a matter of fact, one of the most popular in the service. The reasons for having the exhaust pipes pointed up above the top plane is to carry the gases clear of the occupants. It was at one time customary to carry the pipes along the sides of the body, but this was inconvenient in several ways, especially if the pilot forgot they were there and placed his fingers on them. The resistance is not very great in the case of the vertical pipes, as these are of stream-line section.

**S. Y.** (Anerley).—For admission to the R.N.A.S., apply to the Secretary of the Admiralty, Whitehall, S.W.



#### Sig. Caproni's Views.

INTERVIEWED by our French contemporary *L'Auto*, Signor Caproni has stated that he is about to try to cross the Atlantic on one of his triple motor machines. In laying stress on the advantage of using big aeroplanes for bombing, he pointed out the difficulty he had experienced in getting his ideas adopted. He said that the enemy, helped by their large supplies of labour, had been working with tremendous energy, and produced Goths and Zeppelins with incredible rapidity.

Next spring, he thought, we would see a remarkable blossoming forth of Austro-German effort. The rear will suffer equally with the front. Paris, Lyons, Le Creusot, St. Etienne, St. Chamond will be bombed with a frequency that we do not dream of now. And in the same way the Allies will carry death and desolation into the enemy's country. But they ought not to lose a single minute. It is aviation that will bring the war to an end. Victory will go to that one

of the belligerents who first perfects his aerial army. We must therefore speed up our production. The enemy is on our heels, and making tremendous efforts to gain the mastery of the air, without which victory in modern warfare is nothing but a myth.

#### The Bombing of Germany.

SPEAKING at a public meeting in Manchester on November 7th, under the auspices of the National War Aims Committee, Mr. Bonar Law said:—"In September we dropped about 8,000 bombs behind the German lines, and they dropped less than 100 upon ours. We also dropped 1,700 upon the coast from which enemy aeroplanes came. We did more damage to the enemy in that month than he had done in all the raids he had made upon England since the beginning of the war. We had a considerable number of machines bombing German towns, and though it was only a beginning more had already been done than the public realised."



# The British Air Services

"PER ARDUA AD ASTRA"

UNDER this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the LONDON GAZETTE, it is not repeated in this column.

## Royal Naval Air Service.

L. B. Calnan and J. G. Hughes both entered as Prob. Flight Officers (temp.), seniority, November 5th.

S. J. Bailey entered as Prob. Observer Officer (permanent), seniority Nov. 16th.

J. Whitehead entered as Prob. Observer Officer (temp.), seniority Nov. 10th. A temporary commission as Lieut. (R.N.V.R.) has been granted to E. H. T. Atkinson, B.A., seniority Nov. 12th.

Admiralty, November 7th.

Flight Lieutenant (Temporary).—G. D. Kirkpatrick, to President, for Admiralty Compass Dept., Nov. 5th.

Flight Sub-Lieutenant (Temporary).—R. Sykes, to President, for Admiralty Compass Dept., Nov. 5th.

The following have been entered as Prob. Flight Officers (Temp.), seniority as stated: G. R. McIntyre and G. M. Hughey; Oct. 30th. A. M. Brown; Oct. 31st. C. G. Abel, W. H. Allsopp, A. M. Anderson, C. M. Bates, H. V. Buckenham, E. E. Cook, W. N. Crimp, L. J. Empson, E. MacK. Faris, H. T. Flintoft, L. A. W. Galloway, H. E. Hudson, S. P. Inman, E. N. Johnson, G. V. Key, H. S. Matthews, A. L. Mawer, J. Morgan, H. F. Mulhall, A. R. Padmore, F. W. Paget, W. H. Penwarden, W. R. Plaskitt, J. A. Porter, R. C. Pretty, H. C. Price, R. W. Riddell, C. V. Ronchi, L. V. Russell, P. A. Sainsbury, W. F. A. Small, F. C. Warcham, R. S. Willis, G. W. Wilson, J. F. Wood, W. T. Owen, A. H. Mills-Adams, J. D. McLaren, L. Joslin, and H. A. McInnes; Nov. 4th. L. T. Clark; Nov. 24th.

Mr. G. L. Wright entered as Prob. Observer Officer, seniority Nov. 10th. Messrs. A. Wright and S. Y. Grant both entered as Prob. Observer Officers (Temp.), seniority respectively Oct. 20th and Nov. 4th.

Mr. H. Booker granted temp. commission as Sub-Lieut. (R.N.V.R.), seniority Oct. 27th.

Admiralty, Nov. 10th.

Granted Temporary Commission as Lieutenant, R.N.V.R.—Wm. J. Mair, Edgar Clough, Arthur F. Wickenden, Harold M. Edwards.

Entered as Temporary Probationary Flight Officer.—John D. Baird.

Admiralty, November 12th.

Sub-Lieutenant (Temporary).—J. Kelly, promoted to Lieut. (Temp.); seniority Nov. 9th.

Private.—J. Richmond, entered as Lieut. (Temp.), R.N.V.R.; seniority Oct. 26th.

C.P.O.—J. D. Wallace, granted temp. commission as Sub-Lieut. (R.N.V.R.); seniority Oct. 31st.

Messrs. P. L. Sayers and E. G. Richards, both entered as Prob. Flight Officers (temp.), seniority Nov. 19th.

Mr. W. J. Gibson entered as Sub-Lieut. (temp.), R.N.V.R., seniority Nov. 9th.

## Royal Flying Corps (Military Wing).

London Gazette Supplement, November 6th.

The following appointments are made:—

Flight Commanders.—From Flying Officers, and to be Temp. Capts. whilst so employed:—Lieut. W. D. Thom, S.R.; Oct. 21st. Lieut. W. J. Rutherford, Can. Local Forces; Oct. 22nd. Temp. Lieut. E. R. Cottier, Gen. List; Temp. 2nd Lieut. M. B. Frew, M.C., Gen. List; Oct. 24th.

Flying Officers.—Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—T. G. Drew Brook, G. D. Falkenberg, W. H. Hall; July 7th. J. H. Drewry; Aug. 8th. G. E. Martin; Aug. 15th. H. N. J. Proctor; Oct. 11th. A. C. Hine; Oct. 15th. N. Ramsden, E. C. Bromley, L. H. T. Capel; Oct. 16th. D. Parker; Oct. 17th. W. C. Daniel, J. M. McCallum; Oct. 18th.

Adjutant.—Capt. P. A. Landry, Can. Inf., from May 25th to Sept. 5th, and from Sept. 17th.

Special Appointment.—Graded as a Park Comdr.—Capt. C. W. de Roemer, R.F.A., S.R., from a special appointment, graded as an Equipment Officer, 1st Class, and to be Temp. Maj. whilst so employed; Oct. 19th.

Equipment Officers, 3rd Class.—Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—C. L. Cliffe; Sept. 14th. E. S. Daniel; Oct. 1st. W. T. Hawkins, A. J. Tutton; Oct. 9th. Temp. Lieut. H. L. Billinton, Gen. List, from an Experimental Officer, 3rd Class (graded as an Equipment Officer, 3rd Class); Oct. 18th. The appointment of 2nd Lieut. (Temp. Lieut.) A. R. Langton, R.F.C. (T.F.), notified in *Gazette* of Sept. 7th, is antedated to June 23rd.

Experimental Officer, 1st Class.—(Graded as an Equipment Officer, 1st Class).—Capt. B. T. Neville, Bedf. R., from an Asst. Instr. in Gunnery (graded as an Equipment Officer, 2nd Class); Oct. 19th.

### Schools of Instruction.—Armament School.

Instructor in Gunnery.—(Graded as an Equipment Officer, 1st Class).—Lieut. (Temp. Capt.) J. W. Gordon, S.R., a Flight Comdr.; Oct. 26th.

Assistant Instructor in Gunnery.—(Graded as an Equipment Officer, 2nd Class).—Lieut. G. A. Heath, Gloucester, S.R., from an Asst. Instr. in Gunnery (graded as an Equipment Officer, 3rd Class); Oct. 26th.

General List.—Sgt. T. Aldous from R.F.C., to be Temp. 2nd Lieut.; Oct. 20th. The following cadets to be Temp. 2nd Lieuts. (on prob.):—H. A. Rudge, R. W. Rutland; Oct. 25th.

Memoranda.—Temp. Sgt.-Maj. T. F. Beere, from R.F.C., to be 2nd Lieut. whilst serving with R.F.C.; Oct. 15th. Temp. Hon. 2nd Lieut. H. A. Hobbs.

London Gazette Supplement, November 7th.

The following temporary appointment is made at the War Office:—

Assistant Director.—Or.-Mr. and Hon. Capt. (Temp. Lieut.-Col.) A. Fletcher, M.C., R.F.C., from an Inspecting Officer of Depôts (graded as a Depôt Comdr.), and to retain his temp. rank whilst so employed, vice Capt. (Temp. Col.) C. H. Whittington, R.F.C., S.R.; Aug. 31st.

The following appointments are made:—

Flight Commanders.—From Flying Officers and to be Temp. Capts. whilst so employed:—2nd Lieut. J. D. Payne; Oct. 20th. 2nd Lieut. (Temp. Lieut.) C. R. Richardson, E. York R.; Oct. 22nd.

Flying Officers.—Temp. 2nd Lieut. L. G. Bristow, R.A., and to be transfd. to R.F.C., Gen. List; June 1st. Temp. 2nd Lieut. (on prob.) J. V. Sorsoleil, Gen. List, and to be confirmed in his rank; Oct. 13th. Temp. Lieut. E. W. Greswell, Gen. List, from a Flying Officer (Obs.), seniority from July 29th, 1916. Temp. 2nd Lieut. (on prob.) B. M. T. S. Leete, Gen. List, and to be confirmed in his rank; Oct. 17th. Temp. 2nd Lieut. K. R. Napier, Gen. List, from a Flying Officer (Obs.), seniority from Nov. 1st, 1916. Temp. 2nd Lieuts.

(on prob.), Gen. List, and to be confirmed in their rank:—A. B. Reade; Oct. 18th. C. E. Saines; Oct. 19th. Temp. 2nd Lieut. T. Aldous, Gen. List; Oct. 20th.

Flying Officers (Observers).—Seniority from July 16th:—Lieut. E. W. Trotman, R.F.A., S.R.; 2nd Lieut. R. F. Rowbotham, R.F.A., S.R.; Temp. 2nd Lieut. W. H. Steele, Labour Corps, seniority from July 17th, and to be transfd. to R.F.C. Gen. List; 2nd Lieut. N. A. Arthur, N. Zealand Exped. Force, seniority from July 23rd; Oct. 15th. Lieut. E. M. Farncomb, Canadian Art.; Oct. 19th, seniority from Aug. 7th. Temp. 2nd Lieut. R. H. Reeve, Gen. List, from a Flying Officer; Oct. 1st, seniority from Aug. 8th. 2nd Lieut. J. M. Brisbane, R. Scots (T.F.), and to be sec'd.; Oct. 19th, seniority from Sept. 4th. Temp. 2nd Lieut. (on prob.) J. Reeke, Gen. List, seniority from July 4th, and to be confirmed in his rank: 2nd Lieut. A. V. Farrier, D. of Corn. L.I. (T.F.), seniority from Aug. 6th, and to be sec'd.; (Oct. 20th). Temp. 2nd Lieut. J. Parke, Durh. L.I., and to be transfd. to R.F.C., Gen. List; Oct. 10th, seniority from Aug. 14th. Temp. 2nd Lieut. (on prob.) H. F. Lambert, Gen. List, and to be confirmed in his rank: Oct. 20th, seniority from Sept. 3rd.

With seniority Sept. 10th:—Capt. R. P. Ward, M.C., R.W. Fus. (T.F.), and to be sec'd.; Temp. Capt. O. L. Beater, R. Dub. Fus., and to be transfd. to R.F.C. Gen. List; Oct. 19th. With seniority Sept. 17th:—Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—J. K. Fisher, A. D. Fraser; Oct. 20th.

Balloon Officers.—Lieut. F. D. Wright, S. Lan. R., and to be sec'd.; 2nd Lieut. J. C. Forsyth, M.C., R. Highrs. (T.F.), and to be sec'd.; Oct. 15th.

Special Appointments.—(Graded as Dépôt Comdr.).—From Park Comdr. and to be Temp. Lieut.-Cols. whilst so employed:—Capt. (Temp. Maj.) W. E. G. Statter, R. Lanc. R. Capt. (Temp. Maj.) F. A. G. Noel, S.R.; Oct. 19th. (Graded as an Equipment Officer, 2nd Class).—Lieut. (Temp. Capt.) F. T. Bridger, R. Highrs., S.R., from a Flying Officer, and to retain his temp. rank (without pay or allowances) whilst so employed: Aug. 24th.

Equipment Officers, 3rd Class.—Temp. 2nd Lieut. H. S. Downes, York R., and to be transfd. to R.F.C., Gen. List; July 19th. Temp. 2nd Lieut. A. E. Reynolds, Gen. List; Temp. 2nd Lieut. J. Hooper, Gen. List; July 31st. Temp. 2nd Lieut. (on prob.) W. Godfrey, Gen. List, and to be confirmed in his rank: Sept. 23rd. 2nd Lieut. J. W. Mayall, S.R.; Sept. 30th. Temp. 2nd Lieuts. (on prob.) Gen. List, and to be confirmed in their rank:—C. F. Soanes, H. M. Temple, H. L. B. Buchanan, F. W. Atkinson, G. H. Johnson, R. Leedal, J. H. B. Porter, F. A. Beale, A. E. Steel; Oct. 11th.

General List.—Temp. 2nd Lieuts. to be Temp. Lieuts:—E. J. Detmold, C. S. Fulton, C. A. Mercer, J. T. Kyffin, O. A. E. Allen, J. B. Hinchliff, N. W. Birkett, L. Murray-Stewart, D. G. O'Reilly, A. G. Graves, A. E. Young, A. P. Boor, H. K. Gibson, W. A. Holland, G. G. Jackson, A. G. Mortlock, C. H. Adamson, H. T. W. Oswell, R. H. Dunlop, B. E. Berrington, J. R. Currington, E. J. Leech, S. A. Martindale, H. E. Ranson, J. Wedgwood, H. Lambert, L. Lucas, J. E. Doyle, H. J. W. Collins, A. H. Carman, A. Ashurst, J. A. Harman, C. H. Mather, H. J. McCracken, M. P. Lewis, J. C. A. Cameron, C. F. Overy, A. J. Tyler, D. Lindley, G. B. Monkman, W. G. Duthie, S. N. Veitch, R. V. Walker, M.C., D. Shanks, H. B. Hurst, H. N. Dett, L. D. Kirk, R. K. Morris, V. H. G. Parker, Gen. List, A. E. Watkinson, Gen. List, J. E. Price; July 1st. D. Maclean; July 11th. V. J. Woodcock; July 15th. H. Scandrett; July 16th. L. C. Atwool; July 20th. J. A. Turnbull; July 22nd. E. J. Stockman; Aug. 1st. R. Ferguson; Aug. 20th. R. H. Stocken; Sept. 15th. H. J. Buist, Gen. List, R. W. G. Morrison, E. Surr. R.; Oct. 1st.

2nd Lieutenants to be Temporary Lieutenants.—H. V. Puckridge, Shropshire L.I.; H. J. Hamilton, D. of Corn. L.I.; A. H. Dalton, Hrs.; Oct. 1st. Temp. 2nd Lieut. C. C. Marsden relinquishes his commission on account of ill-health contracted on active service, and is granted the hon. rank of 2nd Lieut.; Nov. 8th. To be Temp. 2nd Lieuts. (on prob.):—Pte. J. H. Lester, from Lond. R. (T.F.); Oct. 18th. E. H. B. C. Linton, E. L. Milborrow, V. B. Napier, G. S. Reid; Oct. 19th.

Supplementary to Regular Corps.—2nd Lieut. J. L. Bradford relinquishes his commission on account of ill-health, and is granted the hon. rank of 2nd Lieut.; Nov. 8th.

London Gazette, Supplement, Nov. 8th.

Military Wing.—The following appointments are made:—

Equipment Officers, 1st Class.—2nd Lieut. (Temp. Lieut.) J. E. L. Wrench, S.R., from the 2nd Cl., and to be Temp. Capt. whilst so employed; Oct. 20th.

2nd Class.—Temp. 2nd Lieut. E. A. Neale, Gen. List, from the 3rd Cl., and to be Temp. Lieut. whilst so employed; Oct. 19th.

3rd Class.—Temp. 2nd Lieut. (on Prob.) W. B. Morison, Gen. List, and to be confirmed in his rank; Sept. 8th. Temp. 2nd Lieut. V. J. Copetake, M.C., Notts and Derby R., and to be transfd. to R.F.C., Gen. List; Sept. 19th. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank: H. G. Burroughs, L. F. W. Stone; Sept. 19th. C. H. Bell, W. T. Close; Oct. 1st. Temp. Lieut. J. Walker, attd. R. Fus., and to be transfd. to R.F.C., Gen. List; Oct. 6th. Capt. J. D. Waddell, Welsh R. (T.F.), and to be sec'd.; Temp. 2nd Lieut. W. T. Watson, Garr. Bn., Worcester, R., and to be transfd. to R.F.C., Gen. List; Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank: J. J. B. Campbell, F. A. Downes, F. Thomasson; Oct. 8th. Capt. the Hon. E. H. J. Boscowen, C. Gds., S.R.; Lieut. C. C. Webb, Leic. R. (T.F.), and to be sec'd.; Lieut. H. Hellier, Gloucester R. (T.F.), and to be sec'd.; Oct. 11th. Temp. Lieut. F. Bagot Kahts, W. Rid. R., and to be transfd. to R.F.C., Gen. List; Oct. 11th. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank: H. C. Newton, T. P. Jenkins; Oct. 11th. A. H. Johnson; Oct. 12th. Qmr. and Hon. Maj. A. Landen, D.S.O., North'd Fus.; Oct. 18th.

### SCHOOLS OF INSTRUCTION.

#### Schools of Military Aeronautics.

Assistant Commander.—Capt. G. Adeley, R. Ir. Rif., is graded as a Park Comdr. and not as in the *Gazette* of Oct. 12th.

#### School of Technical Training.

Company Commanders (graded as Equipment Officers, 2nd Class).—Temp. Lieut. P. P. C. Penberthy, Gen. List, from a Flying Officer; Lieut. G. J. Dewhurst, K. R. Rif. C., S.R.; Lieut. N. O. M. Cameron, Cam's Highrs., and to be sec'd.; Temp. 2nd Lieut. J. W. Cairns, Gen. List, from a Flying Officer, and to be Temp. Lieut. whilst so employed; Sept. 24th.

General List.—Temp. 2nd Lieuts to be Temp. Lieuts; July 1st.—H. M. K. Brown, P. T. Carden, J. McDonald, J. L. Miles, R. Peel, J. Webster; July 1st. To be Temp. 2nd Lieuts (on prob.): G. Spurpin, late Pte., R. Fus.; W. G. Blatherwick; Oct. 19th. W. Maddison, A. N. Weston, late Prob. Flight Officer, R.N.A.S.; Oct. 22nd. Cadets to be Temp. 2nd Lieuts. (on prob.): G. H. Allison, H. D. Anderson, G. A. Anderson, W. E. Angell, J. C. Attewell.

F. Barker, C. A. B. Beattie, K. L. Birtwistle, G. C. Brown, O. H. Brown, H. Brown, J. H. S. Broughall, F. Buckle, C. R. Calder, A. Champ, G. P. W. Chandler, F. W. Cobb, W. E. Copley, G. M. Coull, J. Cross, A. Curley, R. J. Davey, J. W. Davies, C. B. Dove, E. O. Drinkwater, R. W. F. Dunning, A. A. Dutch, A. Eddleston, R. N. Essell, N. E. Evans, J. P. Ferreira, B. H. Garrett, N. J. Graham, A. S. Greenwood, D. B. Griffiths, C. L. Grimwood, W. L. P. Gould, J. W. Hamel, W. N. Harrison, W. C. Harvey, E. Head, H. S. Hennessey, R. C. Hirst, W. E. Hunt, G. R. Iles, C. E. Johnson, F. C. Johnson, T. M. Jones, D. P. Jones, A. F. Judd, S. Jukes, E. J. A. L. Kemp, G. King, H. Kershaw, G. E. Leaman, H. W. Leyland, F. C. Littleboy, H. Loosen, J. Lowe, J. B. Macdonald, J. Macdonald, J. J. McDonald, D. P. McIntyre, E. G. Macpherson, D. McCarter, C. McPhail, R. J. Marshall, C. R. Mason, H. W. Matthews, A. J. B. Meikle, D. C. Melville, T. H. Mercer, C. W. Miller, S. F. Morrissey, D. W. Moscrop, J. J. Musgrave, N. Nuttall, A. Newark, G. A. Osborne, C. Packham, R. W. Payne, St. G. C. Payzant, G. H. Pearce, O. Pearson, C. E. Pullen, A. H. Ramage, D. S. Reid, F. Rennison, W. H. A. Rickett, G. Roberts, W. A. Roberts, S. M. Robins, J. L. Rodrigues, A. Rogerson, T. H. Rogers, J. N. Rookridge, L. H. C. Rutter, L. D. Russell, E. D. Salthouse, W. Sanders, E. Scadding, F. A. Sedore, F. H. N. Sessions, L. C. Sheffield, S. Simons, S. S. Snelling, R. E. H. Springett, J. Stanley, F. Steel, J. Stephens, H. M. Strachan, A. Swinglehurst, D. Taylor, W. H. Thomas, H. N. Tiplady, A. F. Tong, A. F. Turnbull, A. T. Walker, G. V. Wheatley, C. V. Wheatley, A. G. B. Whittaker, L. A. Williamson, H. B. Winton, T. Wright, J. D. Wyatt-Smith, F. Woolley, A. J. Yates: Nov. 8th.

*London Gazette Supplement, November 9th.*

The following temporary appointments are made at the War Office:—  
*Staff Captain*.—2nd Lieut. (Temp. Capt.) N. Martin, R.F.C., S.R., from an Equipment Officer, 1st Cl., and to retain his temp. rank while so employed, vice Temp. Capt. R. W. Roylance, Gen. List; Oct. 20th.

The following appointments are made:—

*Staff Officers, 3rd Class*.—(graded as *Staff Captains*).—2nd Lieut. R. G. Mitchell, R. Scots (T.F.), to be sec'd., and to be Temp. Capt. whilst so employed, vice Temp. Capt. F. W. Prendergast, Leins. R.; Aug. 25th. Temp. Capt. S. Henderson, Gen. List, from an Adjt., R.F.C.; Oct. 17th.

*Squadron Commander*.—2nd Lieut. (Temp. Capt.) S. G. Hodges, M.C. Wilts R.; from a Flight Comdr., and to be Temp. Maj. whilst so employed; Oct. 19th.

*Flight Commanders*.—From Flying Officers. Lieut. S. J. Sibley, S.R., and to be Temp. Capt. whilst so employed; Oct. 24th. Capt. R. N. Montagu-Stuart-Wortley, Yeo. (T.F.); Oct. 25th. And to be Temp. Capts. whilst so employed: Lieut. J. Mitchell, S.R.; 2nd Lieut. C. R. J. Thompson, S.R., Oct. 25th. Temp. Lieut. H. M. K. Brown, Gen. List; Oct. 26th.

*Special Appointment (graded as a Flight Commander)*.—Lieut. C. Patteson, M.C., S. Wales Bord., from a Flying Officer, and to be Temp. Capt. whilst so employed; Oct. 18th.

*Flying Officers (Observers)*.—2nd Lieut. B. Ankars (now a Flying Officer) from Nov. 18th, 1916, to May 16th, seniority from Nov. 5th, 1916, and to retain that seniority as a Flying Officer. Temp. Lieut. G. C. Macintosh, Gen. List (Dec. 31st, 1916, seniority from Oct. 5th, 1916). Temp. 2nd Lieut. O. G. S. Crawford, Gen. List (Oct. 21st, seniority from Feb. 17th). Oct. 21st, seniority from July 4th: 2nd Lieut. C. E. Birch, R.W. Surr. R., S.R., and to be sec'd. 2nd Lieut. D. D'H. Humphreys, Lond. R. (T.F.), and to be sec'd. Temp. 2nd Lieut. (on prob.) H. V. Dorey, Gen. List, and to be confirmed in his rank (Oct. 21st, seniority from Aug. 22nd). Oct. 21st, seniority Sept. 9th: Temp. 2nd Lieut. G. W. Croft, Linc. R. Temp. 2nd Lieut. V. E. Bourdillon, attd. R. Suss. R., and to be transfd. to R.F.C. Gen. List. Oct. 21st, seniority from Aug. 1st: Temp. Lieut. C. H. Wallis, York. R., and to be transfd. to R.F.C. Gen. List. Temp. Lieut. S. G. Barlow, Lan. Fus., and to be transfd. to R.F.C. Gen. List. and Lieut. H. Thomas, Lan. Fus., S.R., and to be sec'd. Temp. 2nd Lieut. H. Stansfield, Gen. List, from an Equipment Officer, 3rd Cl. 2nd Lieut. D. J. Stewart, R. Muns. Fus., S.R., and to be sec'd. Temp. 2nd Lieut. S. Ellis, Gen. List 2nd Lieut. E. G. T. O'Kill, Lond. R. (T.F.), and to be sec'd. (Oct. 21st, seniority from Sept. 3rd). Oct. 21st, seniority from Sept. 11th: Lieut. J. E. Hamming, Can. Engrs. 2nd Lieut. N. S. Dewey, M.C., R.A., and to be sec'd. The date of seniority of Temp. Lieut. J. A. Stedman, M.G. Corps, is Sept. 15th, 1916, and not as in the *Gazette* of July 23rd.

*Assistant Instructors in Gunnery (graded as Equipment Officers, 3rd Class)*.—(Oct. 22nd):—Capt. P. S. Jackson Taylor, Heref. R. (T.F.), from a Flying Officer (Obs.), Temp. Lieut. (Temp. Capt.) W. L. Hill, Gen. List, from an Adjt., R.F.C., and to relinquish his Temp. rank of Capt. Temp. Lieut. G. C. C. Pentland, M.G. Corps, and to be transfd. to R.F.C. Gen. List. Temp. Lieut. J. P. Barrett, Linc. R. 2nd Lieut. A. L. C. Fuller, D. Gds., from Temp. Lieut., M.G. Corps. Temp. 2nd Lieut. A. F. Hamby, Essex R. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank: T. C. Sterndale-Bennett, H. W. Hire; Temp. Lieut. H. Scott, Middx. R.; Temp. Lieut. T. L. Meares, Gen. List; Temp. Lieut. E. F. Millar, Notts and Derby R.; Lieut. B. C. Lester, R.A., and to be sec'd.; and Lieut. W. J. G. Barnes, R. Sc. Fus. Temp. 2nd Lieut. W. B. Rayner, attd. K.R.R.C., and to be transfd. to R.F.C. Gen. List. Temp. 2nd Lieuts. (on prob.) Gen. List, and to be confirmed in their rank: T. G. H. Goodacre, D. A. A. Christie.

*Balloon Commanders (graded as Balloon Officers)*.—From Balloon Officers, and to be Temp. Lieuts. whilst so employed: Temp. 2nd Lieut. D. J. W. Walker, Gen. List; Oct. 15th. 2nd Lieut. O. L. Vetter, S.R.; Oct. 22nd. Temp. 2nd Lieut. J. H. O'Connell, Gen. List. Oct. 26th.

*Adjutant*.—Temp. Lieut. A. H. S. Baker, Gen. List, and to be Temp. Capt. without the pay or allowances of that rank) whilst so employed; Oct. 19th.

*Special Appointment (graded as a Park Commander)*.—Temp. Capt. A. M. Thom, M.C., Gen. List, from an Equipment Officer, 1st Cl., and to be Temp. Maj. whilst so employed; Oct. 19th.

*Equipment Officers, 1st Class*.—From the 2nd Cl., and to be Temp. Capt. whilst so employed: Lieut. H. L. Hughes, S.R.; Sept. 1st. Lieut. B. Mott, S.R.; Oct. 16th.

*2nd Class*.—From the 3rd Cl.—Temp. 2nd Lieut. E. E. Jolly, Gen. List, and to be Temp. Lieut. whilst so employed; Oct. 18th. Lieut. E. D. L. Davies, S.R.; Oct. 20th.

*3rd Class*.—Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank: R. T. B. Wynn; Oct. 1st. A. Colledge, D. W. Godden, P. F. Doré, H. C. Bolingbroke, T. I. Bowen, W. White, H. W. Mason, R. W. Lane, F. H. Alldridge, I. Powell; Oct. 11th. E. B. Crampton, H. S. Alger, H. H. Cox, B. A. Higgins, A. W. Cordery, F. J. F. English, S. R. Moore, T. S. Nash, C. B. Newman, A. W. H. Osborne, J. de la M. C. Rowley, H. A. Chapman, T. I. Grimes, J. E. Kingham, C. J. F. Kynaston, A. E. Millson, P. H. Newberry, F. B. Reed, W. M. Sercombe, H. J. Kibble, A. G. Ridgon, C. E. Yates, F. M. Pepper, E. S. Baker, C. H. Boreham, E. L. Botham, F. W. M. Pedley, L. H. Seccombe, S. G. Yapp, C. Clayden, C. E. Maryon, H. R. Hardy, F. R. T. Pearson, C. S. Buckingham, L. Shears; Oct. 18th.

*General List*.—Temp. 2nd Lieut. H. L. Blatchford resigns his commission (Aug. 10th). To be Temp. 2nd Lieuts. (on prob.): H. F. Crowe (Sept. 11th), N. G. Cox (Oct. 22nd).



To Readers—One and All.

The Editor of "FLIGHT" will at all times be pleased to consider original articles (illustrated or otherwise) on subjects directly or indirectly allied with aviation. All articles

*Supplement to Regular Corps*.—Lieut. T. L. Collins relinquishes his commission on account of ill-health, and is granted the hon. rank of 2nd Lieut.; Nov. 10th.

*Attached to Headquarters Units*.

*Brigadier Commander*.—Bt. Lieut.-Col. (Temp. Brig.-Gen.) L. E. O. Charlton, C.M.G., D.S.O., Lan. Fus., from a Dir. at the War Office, and to retain his temp. rank whilst so employed, vice Bt. Lieut.-Col. (Temp. Major-Gen.) C. A. H. Longcroft, Welsh R.; Oct. 18th.

The following temp. appointment is made at the War Office:—

*Director*.—Major (Temp. Brig.-Gen.) G. Livingstone, C.M.G., Lond. R. (T.F.), from a Brig. Gen. R.F.C. Staff (graded as a Brig. Comdr.), and to retain his temp. rank whilst so employed, vice Bt. Lieut.-Col. (Temp. Brig.-Gen.) L. E. O. Charlton, C.M.G., D.S.O., Lan. Fus.; Oct. 18th.

The following appointments are made:—

*Flight Commanders*.—From Flying Officer:—Capt. J. G. S. C. Smith-Grant, R. Scots (T.F.); Oct. 23rd. And to be Temp. Capts. whilst so employed:—Lieut. L. J. MacLean, M.C., R.E.; Oct. 24th. 2nd Lieut. A. E. McKeever, S.R.; Oct. 26th.

*Special Appointment (graded as a Flight Commander)*.—Lieut. G. L. Lumsden, Canadian Exped. Force, a Flying Officer, and to be Temp. Capt. whilst so employed; Aug. 10th.

*Flying Officers (Observers)*.—Temp. 2nd Lieut. (on prob.), G. Murray, Gen. List, and to be confirmed in his rank; Aug. 5th. Oct. 23rd, seniority from Aug. 22nd:—Temp. 2nd Lieut. L. E. Evans, R.A., and to be transfd. to R.F.C., Gen. List; 2nd Lieut. F. R. S. Wakeford, Yeo. (T.F.), and to be sec'd.; 2nd Lieut. J. M. A. Ewer, R.G.A., S.R.; 2nd Lieut. A. C. Cooper, Lond. R. (T.F.), seniority from Sept. 2nd, and to be sec'd.; Lieut. J. D. O'Neill, Canadian Exped. Force, seniority from Sept. 3rd; Oct. 23rd. Lieut. E. G. Birbeck, M.C., N. Staffs R., and to be sec'd.; Oct. 22nd, seniority from Sept. 10th. Seniority from Sept. 10th:—2nd Lieut. C. Flavell, Mon. R. (T.F.), and to be sec'd.; 2nd Lieut. J. G. Glendinning, Mon. R. (T.F.), and to be sec'd.; Oct. 23rd.

*Assistant Instructors in Gunnery (graded as Equipment Officers, 3rd Class)*.—Temp. Lieut. G. M. Garro-Jones, Gen. List, from a Flying Officer (Ob.); Temp. Lieut. R. C. Graham, M.G. Corps, and to be transferred to R.F.C., Gen. List; Temp. Lieut. C. J. Poole, Gen. List, from a Flying Officer (Ob.); 2nd Lieut. (Temp. Lieut.) A. V. Shewell, Glouce. R., from a Flying Officer (Ob.), and to be sec'd.; 2nd Lieut. (Temp. Lieut.) H. Davis, E. York R., S.R., from a Flying Officer (Ob.); 2nd Lieut. (Temp. Lieut.) J. A. P. Martin, Yeo. (T.F.), from a Flying Officer (Ob.); Oct. 22nd. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—U. P. Jonckheer, J. M. McEntegart.

*Adjutant*.—Lieut. L. Henshall, S. Lan. R. (T.F.), to be sec'd., and to be Temp. Capt. (without the pay or allowances of that rank) whilst so employed; Oct. 17th.

*Depot Commanders*.—Capt. (Temp. Major) A. V. Bettington, S.R., from a Sqdn. Comdr., and to be Temp. Lieut.-Col. whilst so employed; Aug. 7th, but without pay or allowances prior to Nov. 1st (substituted for the notification in the *Gazette* of Oct. 18th). Capt. (Temp. Major) C. G. S. Gould, R.A., from a Sqdn. Comdr., and to be Temp. Lieut.-Col. whilst so employed; Nov. 1st.

*Park Commander*.—Temp. Capt. G. L. Wightman, Gen. List, from an Equipment Officer, 1st Cl., and to be Temp. Major whilst so employed; Oct. 15th.

*Equipment Officers, 3rd Class*.—Temp. Lieut. M. H. Unwin, Gen. List; Sept. 5th. Temp. 2nd Lieut. (on prob.) E. W. Hooton-Smith, Gen. List, and to be confirmed in his rank; Oct. 11th. 2nd Lieut. F. C. Griffin; Oct. 12th. Temp. 2nd Lieut. (on prob.) H. Archer, Gen. List, and to be confirmed in his rank; Oct. 24th.

*General List*.—Temp. 2nd Lieut. C. W. Cudmore to be Temp. Lieut.; July 1st. H. R. Hollis to be Temp. 2nd Lieut. (on prob.); April 24th. Temp. 2nd Lieut. C. C. Cox is removed from the Army, the King having no further occasion for his services as an officer; Nov. 11th.

*Memoranda*.—Bt. Lieut.-Col. (Temp. Brig.-Gen.) C. A. H. Longcroft, Welsh R., to be Temp. Major-Gen.; Oct. 18th. Temp. Sgt.-Major N. Hemsley, from R.F.C., to be 2nd Lieut.; Sept. 17th.

*Supplementary to Regular Corps*.—2nd Lieut. N. E. Kelk relinquishes his commission on account of ill-health, and is granted the Hon. rank of 2nd Lieut.; Nov. 11th. To be 2nd Lieut. (on prob.) C. A. Holt, K. N. Smith; July 14th.

*London Gazette Supplement, November 12th.*

*Attached to Headquarters Units*.

*Brigadier Commander*.—Bt. Maj. (Temp. Lieut.-Col.) E. R. Ludlow-Hewitt, M.C., R. Ir. Rif., from a Wing Comdr., R.F.C., and to be Temp. Brig.-Gen. whilst so employed, vice Bt. Maj. (Temp. Col.) P. L. W. Herbert, Notts and Derby R.; Oct. 17th.

The following appointments are made:—

*Staff Officer, 2nd Class (graded for purposes of pay as a Brigadier-Major)*.—Lieut. (Temp. Capt.) C. W. Wise, A.S.C., S.R., from Adjt., and to retain his temp. rank whilst so employed; Sept. 6th.

*Flight Commanders*.—From Flying Officers, and to be Temp. Capts. whilst so employed: Temp. Lieut. W. G. Chambers, Linc. R.; Oct. 1st. Temp. Lieut. N. O. Vinter, Gen. List; Oct. 27th.

*Flying Officers*.—Temp. 2nd Lieut. H. G. W. Debenham, Gen. List, from a Flying Officer (Obs.), seniority Oct. 24th, 1916; Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank: G. Walker, J. L. Armstrong; Oct. 11th. M. G. le Marchant; Oct. 12th. C. L. Van der Hoff; Oct. 18th. E. G. Dickie; Oct. 20th. W. H. Bickell, A. F. Smith; Oct. 22nd.

*Group Commander*.—Bt. Maj. (Temp. Brig.-Gen.) P. L. W. Herbert, Notts and Derby R., from a Brig. Comdr., relinquishes his temp. rank and to be Temp. Col. whilst so employed; Oct. 17th.

*Equipment Officers, 1st Class*.—From the 2nd Cl.: Capt. W. R. Bruce-Clarke, Lond. R., T.F.; Lieut. G. L. Godden, S.R., and to be Temp. Capt. whilst so employed; Oct. 22nd.

*2nd Class*.—Ormr. and Hon. Maj. A. Landen, D.S.O., North'd Fus., from the 3rd Cl., and to be Temp. Lieut. whilst so employed; Oct. 23rd.

*Schools of Military Aeronautics*.

*Commandant (graded as a Wing Commander)*.—Capt. (Temp. Maj.) G. C. de Dombasie, Can. Local Forces, a Sqdn. Comdr., and to be Temp. Lieut.-Col. whilst so employed, vice Maj. (Temp. Lieut.-Col.) I. M. Bonham-Carter, North'd Fus.; Sept. 10th.

*Instructor (graded as an Equipment Officer, 1st Class)*.—Rank of Capt. G. I. N. Deane, R.E., T.F., is as now described, and not as in *Gazette* of Oct. 10th.

*General List*.—Temp. 2nd Lieuts. (Temp. Lieuts.) to be Temp. Lieuts.:—B. Hamel, G. M. E. Bayly, A. B. W. Greenhough, M.C., A. L. Hyslop, C. R. Alston, G. G. Hargrave, D. Blaikie, D. G. C. Wakeham, J. B. Anderson, D.S.O., A. W. Stevenson, V. I. Olliver, E. L. Zink, B. B. Howe, F. J. N. Macrae, A. Chapman, E. T. Smith, W. H. Palien; July 1st. L. A. Rushbrooke; July 6th. W. Hallitt; July 15th. J. Edwards; Sept. 26th. O. W. Clapp; Sept. 28th. L. R. Charron; Oct. 11th. A. Hughes; Oct. 16th. W. L. Keefer to be Temp. 2nd Lieut. (on prob.); Oct. 27th.



accepted will be paid for; a high literary standard of writing is not essential; it is the facts which matter. Practical explanatory articles are most acceptable. Diagrams and similar illustrations need only be rough sketches if necessary.

# AIRCRAFT WORK AT THE FRONT.

## OFFICIAL INFORMATION

**British.**

*General Headquarters, November 5th.*  
"On the 4th inst., owing to thick mist, little flying was possible except on the coast. In this sector successful artillery work and photography were carried out, and one German aeroplane was brought down in air fighting. None of our machines are missing."

*General Headquarters, November 6th.*

"On the 5th inst. there was a slight improvement in the weather, but mist still prevented our aeroplanes from carrying out artillery and photographic work."

"Only a few combats took place, in the course of which two enemy machines were brought down. In addition, a low-flying hostile machine was shot down in our lines by our infantry. One of our machines is missing."

*Admiralty, November 7th.*

"On the night of November 6th bombing raids were carried out by the Royal Naval Air Service on the following military objectives:—Thourout railway station; Lichtervelde railway station; on a moving train near Lichtervelde. Several direct hits on track and junctions are reported, but visibility was poor. Large quantities of explosives were dropped. All our machines returned safely."

*General Headquarters, November 7th.*

"During the morning of the 6th inst. high wind and rain greatly interfered with work in the air. Nevertheless our low-flying aeroplanes maintained constant touch with our advancing infantry, and, in addition, fired a large number of rounds from their machine-guns at the enemy shell-holes as well as in back areas. Many fleeing targets were signalled to our artillery from the air, and were successfully dealt with by our batteries. During a fair interval many of our aeroplanes, acting in conjunction with our operations on the ground, penetrated well east of the line. Whilst so employed they were caught in a heavy mist which suddenly developed, and seven machines failed to return."

"During the night 62 heavy bombs were dropped on the enemy's railways, communications, billets, and aerodromes in the vicinity of Roulers and Courtrai. Several large explosions, which were followed by fires, were observed in Roulers station and town."

"In air fighting one German machine was brought down, and two others were driven down out of control. Four of our aeroplanes are missing, in addition to those mentioned above."

*General Headquarters, November 8th.*

"During the morning of the 7th instant low clouds and rain considerably hampered aerial work. In the afternoon, however, weather conditions improved, and some successful artillery and photographic work was carried out by our aeroplanes. Our low-flying machines fired many rounds at hostile troops and transport, and a number of bombs were dropped in the course of the day on the enemy's trenches and billets."

"During the night over three tons of bombs were dropped on the enemy's aerodromes at Gantrode and St. Denis Westrem, and on aerodromes in the valley of the River Lys. Railway communications were also bombed, and satisfactory results were observed. Few hostile aeroplanes were encountered, but one was driven down out of control, and an enemy observation balloon on the ground was destroyed by one of our low-flying machines. One of our aeroplanes failed to return."

*War Office, November 8th.*

"*Palestine.*—Our aeroplanes inflicted losses on troops retiring, and on concentrations at railheads."

"*Mesopotamia.*—Much war material has been captured (at Tekrit), including . . . two aeroplanes."

*General Headquarters, November 9th.*

"On the 8th instant the weather conditions during the early morning were good for flying. Later in the day, however, aerial work was carried out under considerable difficulties owing to strong westerly wind, with heavy clouds and occasional rain. A large amount of work was accomplished by our aeroplanes in conjunction with our artillery, and a number of photographs were taken. Our low-flying machines co-operated in raids carried out by our troops on the German trenches and fired many rounds at hostile infantry and machine-guns. Numerous bombs were dropped during the day on the enemy's trenches and billets with good results, but unfavourable weather prevented bombing by night. A very large number of fights took place in the air. Twelve hostile machines were brought down and six were driven down out of control. Two other hostile machines were shot down by anti-aircraft guns. Ten of our machines are missing, including one which failed to return from a bombing raid on the night of the 7th-8th instant."

*General Headquarters, November 10th.*

"More favourable weather conditions prevailed on the 9th inst., and a large amount of work was carried out in the air. The enemy's infantry and transport were engaged by our low-flying aeroplanes on several occasions, and were seen to suffer casualties. During the past 24 hours three tons of bombs have been dropped on hostile billets and aerodromes, good results being observed. In air-fighting one hostile machine was brought down and five others driven down out of control. Two of our aeroplanes are missing."

*Admiralty, November 10th.*

"On the night of November 9th a bombing raid was carried out by the Royal Naval Air Service on the following military objectives:—St. Denis Westrem, Bruges Docks. Large quantities of explosives were dropped with good results, a large fire being caused at the latter place. All our machines returned safely."

*War Office, November 10th.*

"*Palestine.*—Our aeroplanes continue to bomb retreating bodies of the enemy and important centres on his communications with considerable effect; in this way nearly 300 bombs were dropped during the day."

**The Output of Aeroplane Engines.**

AFTER referring to the great increases in the output of guns and ammunition, Mr. Bonar Law, speaking at the Lord Mayor's Banquet, said:—"It is the same everywhere. We have heard of our aeroplane service. Last year, already, it was expanding, but in last month we turned out three times the number of aeroplane engines which we turned out in October last year. I don't know whether these figures give you the picture which they present to me, but is it not the fact that all these things show an amount of organisation of a peaceful country for war such as has never happened before in the history of the world? It would not have been possible without the whole-hearted co-operation of the people of this country. It would not have been possible without the help of the women

*General Headquarters, November 11th.*  
"On the 10th inst. rain fell nearly all day, and made work in the air almost impossible. Many attempts were made by our aeroplanes to gain touch with our attacking infantry, and a small amount of artillery work was accomplished. Rain continued to fall throughout the night, and, in consequence, bombing operations had to be suspended. Such machines as attempted to work over the enemy's lines returned safely to their aerodromes."

*General Headquarters, November 12th.*  
"In spite of stormy weather, a considerable amount of aerial work was carried out by our aeroplanes on the 11th inst. in conjunction with our artillery. A few bombs were dropped during the day on hostile billets and trenches, but bad weather conditions made observation of results difficult. A large number of rounds were fired from machine guns at ground targets by our low-flying aeroplanes, and in one case a hostile battery was silenced. Air fighting was carried out under considerable difficulties owing to low clouds. One hostile machine was destroyed and four others were driven down out of control. None of our machines are missing."

*French.*

"In the course of the night of November 6th-7th our bombing squadrons dropped 2,300 kilograms of explosives on the railway stations of Thourout, Cortemarck, Roulers and Lichtervelde. All the objectives were hit."

*Paris, November 8th.*

"Enemy aeroplanes dropped 50 bombs on the Dunkirk region. Three persons were killed and three injured."

"The hospital at Zuydcoote was also attacked by enemy aeroplanes, which dropped incendiary bombs. Seven persons belonging to the hospital staff were killed and nine injured."

*Italian.*

"On the night of November 3rd-4th and yesterday our aeroplanes and airships effectively bombed the hostile troops in the basins of Caporetto and Tolmino and along the left bank of the Tagliamento. During November 3rd, besides the two machines already mentioned yesterday, our aviators brought down three more enemy aeroplanes, one of which fell in the vicinity of Caldonazzo and the other two in the lagoon of Grado."

*Rome, November 5th.*

"This morning an enemy aeroplane was brought down at Nervesa."

*Rome, November 7th.*

"During yesterday and last night our aeroplanes and airships repeatedly bombed enemy troops at work for the repair of the bridges on the Tagliamento or in movement across the river. Four hostile machines were brought down by our airmen."

*Rome, November 8th.*

"In spite of the strong resistance on the part of hostile machines, our aviators renewed the bombardments on enemy troops along the Tagliamento. Five enemy aeroplanes have been brought down."

*Rome, November 10th.*

"Last night five of our airships effectively bombed the crossing on the Tagliamento at Latisana and Motota di Livenza, and the troops moving on the road leading to the river."

*Belgium.*

"Our aircraft were very active yesterday. Adjutant de Meuleweester brought down his sixth machine."

*Russia.*

"On the Roumanian front in the region of Nantin, 16 miles north of Focșani, on the evening of November 7th, three of our aeroplanes fought two enemy machines, which were brought down and fell in the enemy's lines near the village of Prissaka."

*German.*

"Since November 3rd the enemy has lost in aerial battle and by our anti-aircraft fire 24 aeroplanes. Lieutenant Wüsthoff has gained his 24th and 25th aerial victories."

*Berlin, November 9th.*

"In aerial battle and by our defensive fire the enemy have lost 13 aeroplanes. Lieutenant Müller gained his 2nd. Lieutenant von Bülow his 25th Lieutenant Böhme his 22nd, Lieutenant Bongartz his 21st aerial victory."

*Berlin, November 10th.*

"Lieutenant Baron von Richthofen has gained his 25th aerial victory."

*Berlin, November 11th.*

"Lieutenant Wüsthoff has gained his 26th aerial victory."

*Berlin, November 12th.*

"In October, enemy losses in aerial forces on the German front amounted to nine captive balloons and 244 aeroplanes, of which 149 were behind our lines, and the remainder were observed to have fallen beyond the enemy positions. We lost in battle 67 aeroplanes and one captive balloon. Lieutenant Müller has gained his 33rd victory."

*Turk'sh.*

"Of the five enemy airmen who dropped bombs on Kifri, in Mesopotamia, three were brought down by our artillery fire."

"In Syria two out of five enemy aeroplanes, which unsuccessfully bombed Haifa, fell into the sea as a result of damage. The wrecked machines sank after the occupants had been rescued by an enemy monitor."

"*Sinai Front.*—A British captive balloon, which had broken loose, was shot down over Ascalon."



who are doing the work of the men who are lining the trenches."

**The First Lord and the R.N.A.S.**

IN his speech at the Lord Mayor's Banquet, replying to the toast of the Imperial Forces—the Royal Navy the Army and the two branches of the Air Service, Sir Eric Geddes, First Lord of the Admiralty, said:—"With all that I have said about the navies afloat, I warmly associate the Navy that flies. Comrades on the sea are the first to acknowledge the gallantry and efficiency of the Royal Naval Air Service in their co-operation with the Fleet over the sea, and also in the magnificent services they are rendering in assisting their comrades of the British Army all over the world."

## LEGAL INTELLIGENCE.

### The Right to Take Cover.

At Bow County Court on November 7th Judge Graham, K.C., gave a considered judgment in a Workmen's Compensation Act claim by Henry Cridge, a stevedore, the respondents being Messrs. Pennell and Son, of South-West India Dock. On the occasion of a German air-raid appellant was working in a hold, when someone shouted that aeroplanes were overhead, and all the men rushed to shore to take cover. In getting on deck for his coat, the appellant slipped and broke his leg. It was argued that the accident did not arise in the course of his employment, as he had left it and no one had told him to take cover.

His Honour said there was a vital difference between work ceasing and employment ceasing. He had not ceased, but knocked off in precisely the same way as if a fire had broken out in the hold. His Honour thought it was an implied term of the contract of employment that when he honestly believed danger was impending, the workman should avoid that danger if possible, in his employers' interests as well as his own. Therefore he was fulfilling a duty. Then it was said that the risk was not incidental to his employment, that the risk was a common one, to which large numbers were exposed. It appears this had no bearing on this case. If he had been injured by a bomb, His Honour would have had to decide the common risk, but he was injured by a slip, and the only connection with bombs, if there was any, was the expectation that they might fall, which had alarmed him. His Honour held he was running a common risk and there would have to be an award for the applicant, for an amount to be agreed between the parties, with costs on Scale B.

Leave to appeal was granted.



### With the Italian Aviators.

A CORRESPONDENT of the *Times* at the Italian Headquarters writing on November 7th, said:—

"The airmen have been doing brilliantly, and despite having to destroy aerodromes and camps they have, since the offensive began, crashed some 50 enemy machines. Baracca brought down two on Monday, and has now 26 to his credit.

"These same airmen have brought information that the heroic Alpini on Monte Nero (east of the Isonzo) were still firing on the Austro-Germans last Sunday, though then isolated hopelessly in the centre of miles of hostile country, with no human hope of succour. All is well with Italy while she has men like these."

### Allied Raids on Alsace-Lorraine.

A KARLSRUHE despatch published in the *Frankfurter Zeitung* reports that aeroplane attacks were made on November 1st on various towns and villages in Alsace-Lorraine.

Just before midday five aeroplanes dropped 13 bombs on Mittersheim, doing no damage worth mentioning and an attack on Schlettstadt was made shortly after midday, with a like result, almost all the bombs falling in open fields, one only dropping near a waterworks, and this without effect. Two and a half hours later, according to the telegram, a larger squadron passed over Schlettstadt on its way to Offenburg, while four French airmen also flew over Colmar, where one man was wounded. One machine is declared to have been brought down near Colmar, containing the commander of the squadron and a pilot, both of whom are reported to have been killed.

### Harrying the Turks.

DESCRIBING the retreat of the Turks north of Gaza, Reuter's correspondent on the Egyptian front, under date of November 10th, says:—"The airmen rendered the enemy's retreat more disastrous by bombing and using their machine-guns. Two hundred bombs were dropped on the Arak Menshiyeh Aerodrome. A group of seven machines was hit and a hangar set on fire. Two others were blown in. The railway line and the station buildings were severely damaged. A direct hit was scored on a train. Another train was caught under machine-gun fire. A hostile aeroplane was brought down in flames. All our machines returned safely."

### The End of a Gotha.

It was reported from Paris last week that the Gotha wrecked off the French coast at 1 a.m. on November 4th ran into rocks off Cape Blanc Nez and dropped on the beach between Sangatte and Wissant. When the tide rose the four men who were on board were drowned.

### Hun Aeroplane Over Holland.

ABOUT fifteen German aeroplanes passed along the Belgian frontier of the province of Zeeland on November 9th. One of them, which violated Dutch neutrality by crossing into Holland, was heavily shelled by Dutch troops.

### Dutch Bag a Balloon.

A LARGE German captive balloon of the Parseval type was shot down by Dutch troops near Amersfoort on November 7th, according to information received by the *Handelsblad*. It is said to have been furnished with three floating balloons and marked with two red crosses.

### For German and Neutral Consumption.

AN interesting sidelight on how the German wireless reports are made up is supplied by a Reuter message which states that the three occupants of the German aeroplane which made a forced landing in Holland on September 29th, after taking part in the attempted raid on London the previous evening, informed the Dutch authorities that they had only reached Ramsgate, where they had dropped one bomb. They stated that they had been unable to proceed beyond Ramsgate owing to the fog, and the heavy firing from the English coast defences, and that they were bringing back the rest of their bombs to Ghent when forced to land in Holland, near Sas van Gent.

The officers wrote out a telegram in German, however, informing the Berlin authorities that they had successfully bombed London and had made a forced landing in Holland.



### NEW COMPANIES REGISTERED.

CHISWICK AVIATION WORKS, LTD.—Capital £1,000, in £1 shares. Manufacturers of and dealers in aircraft, motors, etc. First directors: J. Dockx and L. Pauwels.

H. V. LORIE AND CO., LTD., 32, Scrubbs Lane, Willesden, N.W. 10.—Capital £1,000, in £1 shares. General and aeronautical engineers and manufacturers, manufacturers of button making machinery, etc. First directors: R. Hagens (Belgian), R. H. Simpkin and H. C. Bathurst (both British).

### BUSINESS NAMES REGISTRATIONS.

HENRY KNOX AND CO.—Registered October 15th, 1917. Aeronautical engineers, 39, St. James Street, S.W. 1. Proprietor: Henry Knox (British), 3, Clifford Street, Bond Street, W. Other business occupation: Aeronautical engineer to F.I.A.T. Motors, Ltd., Wembley. Business commenced October 1st, 1917.



### Aeronautical Patents Published.

#### Applied for in 1916.

The numbers in brackets are those under which the Specifications will be printed and abridged, &c.

Published November 15th, 1917.  
 15,102. R. W. SPRINGER. Flying machines. (110,407.)  
 15,618. SOPWITH AVIATION CO. and T. SORWITH. Wind brakes. (110,419.)  
 16,717. C. M. VON EUGEN. Aeroplane fuselages. (110,433.)

#### Applied for in 1917.

The numbers in brackets are those under which the Specifications will be printed and abridged, &c.

Published November 15th, 1917.  
 112. K. W. ROBINSON. Steering apparatus for aircraft. (110,454.)  
 2,910. T. P. BROOKE. Flying boats and wings therefor. (110,472.)  
 12,755. T. J. CONNOR. Means to prevent forward tilting of aeroplanes when on the ground. (110,534.)

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